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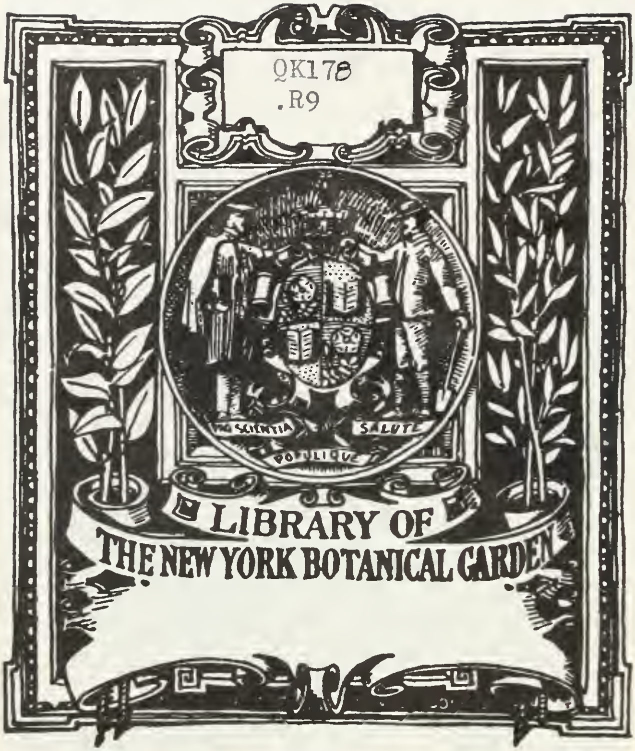

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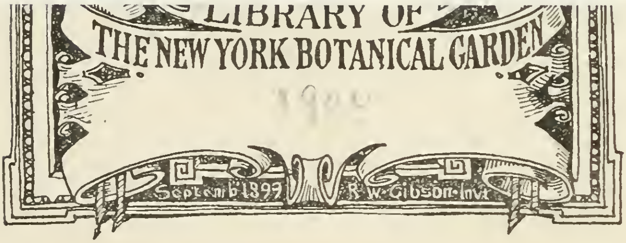

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VOL. I

CATALOGUE

OF THE

FLORA OF MONTANA

AND THE

YELLOWSTONE NATIONAL PARK

BY

PER AXEL RYDBERG, PH.D.

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PREFACE.

In the summer of 1895 Mr. C. L. Shear and the author were commissioned field agents by the Division of Agrostology of the United States Department of Agriculture, and about seven weeks were spent within the state of Montana. Collections were made in the vicinity of several stations of the Union Pacific Railroad from Lima to Silver Bow; at Deer Lodge; and at nine stations of the Northern Pacific Railroad from Garrison to Bozeman. The following summer I was again detailed by the Division for work in Montana, and was accompanied by Mr. J. H. Flodman, of Luther Academy, Wahoo, Nebraska, who made a private collection at the same time. Collections were made in the Spanish Basin of the Madison Range; in and around the Bridger, Elk, Little Belt, and Crazy Mountains; and in the Gallatin and Musselshell Valleys.

Although my work during these two summers was practically confined to the grasses and other forage plants, I gained a fair knowledge of the general flora of the state. About two years ago I published three papers in the *Bulletin of the Torrey Botanical Club*, under the title, "Rarities from Montana," and in them several new species were described.

In the summer of 1897, through the generosity of Mr. William E. Dodge, of this city, a botanical expedition was sent out to Montana and the Yellowstone National Park, under the auspices of this institution. The author was in charge of the expedition, and was assisted by Mr. Ernst A. Bessey, then of the University of Nebraska. Three months were spent in the field. With Bozeman as our base, we visited first the Bridger Mountains and the Spanish Basin, then crossed over into the Madison Valley, which we followed up into the Yellowstone Park, and returned by way of the Yellowstone River and Trail Creek Pass to Bozeman. At the following stations collections were made: Bridger Mountains, Spanish Basin, Pole Creek, Pony, Old Hollowtop in the Pony or South Boulder Mountains, Meadow Creek, Jack Creek Cañon, Cedar Mountain, Indian Creek Cañon and surrounding mountains, Wolf Creek, the Forks of the Madison, and Cliff Lake, all in Montana; Mt. Chauvet on the boundary line between that state and Idaho; near Henry's Lake, in Idaho; Upper Madison Cañon, Lower, Biscuit, Upper and Lone Star Geyser Basins, East DeLacy's Creek, Shoshone Lake, Yellowstone Lake near the Natural Bridge, Yellowstone Falls, Willow Park, and Swan Lake, all in the Yellowstone Park; Electric Peak on the boundary line; and at Fridley, Emigrant Gulch, and Trail Creek Pass in Montana. These collections contain over 1,800 numbers, representing about 800 species and over 20,000 specimens.

In working up these collections it was found that the flora of the state of Montana was very little known and still less understood. It was therefore considered advisable to extend the work and study all the material from the state that was accessible. This has had results far beyond my expectations, for of the 1976 species and varieties included in this catalogue, 776 are not contained in Coulter's Manual of the Rocky Mountain Region, the only published flora including the state of Montana, and 163 species and varieties are new to science.

I wish to thank especially Mr. Frank Tweedy, of the United States Geological Survey, for the loan of his private herbarium, so rich in Montana and Yellowstone Park plants, and the Trustees of the Montana College of Agriculture and Mechanical Arts, at Bozeman, for the loan of the collections belonging to that institution. These latter contained two collections made for the Columbian World's Fair held in Chicago, one by the Rev. F. D. Kelsey and Mr. R. S. Williams, and the other by several ladies, among them Mrs. Moore, Mrs. Alderson, Mrs. Fitch, Miss Ware, Mrs. Muth, Mrs. McNulty and Mrs. Hodgman. I also wish to thank the curators of the Gray Herbarium at Harvard University, of the Academy of Sciences at Philadelphia, of the College of Pharmacy in New York, and of the National Herbarium and of the Division of Agrostology at Washington, for specimens loaned, and for help in determinations; also the following persons: Dr. Thomas C. Porter, of Easton, Penn.; Mr. Peter Koch and Dr. Blankinship, of Bozeman, Mont., and Professor Aven Nelson, of Laramie, Wyoming. The grasses secured in the collections made for the Division of Agrostology were necessarily determined there; those in the collections of Mr. Flodman, and of Mr. Bessey and myself were determined by Mr. George V. Nash. Nearly all the Carices have passed through the hands of Professor L. H. Bailey. In Polygonaceae and Saxifragaceae I have had help from Dr. J. K. Small; and in the Umbelliferae Dr. J. N. Rose has rendered valuable assistance.

The following is a list of the collections seen by me, and the institutions in which they are deposited:

Lewis & Clark, 1803–6, Academy of Sciences, Philadelphia.*

Nathaniel B. Wyeth, 1832, Academy of Sciences, Philadelphia, type set; Columbia University, duplicate set.

Thomas Nuttall, 1834, Columbia University, a few duplicates.*

Charles A. Geyer, 1843–4, Columbia University, a few duplicates.*

Dr. Suckley, Steven's Expedition, 1853–4, Columbia University, duplicate set.*

Dr. Cooper, 1854, Columbia University, type set (?).

John Pearsall, Mullan's Expedition, 1858–62, Columbia University, type set.

Dr. Lyall, 1861, Gray Herbarium, a few duplicates.*

Hayden Survey, 1859–60, Columbia University, a few duplicates.*

Hayden Survey, 1871, New York Botanical Garden, duplicate set; some of the type set in Dr. Porter's Herbarium.

Hayden Survey, 1872, College of Pharmacy, partial duplicate set.

C. C. Parry, Jones' Expedition, 1873, Columbia University, complete duplicate set.*

Sereno Watson, 1880, Gray Herbarium, type set, but only partially examined.

William M. Canby, 1882–3, College of Pharmacy, type set.

F. Lamson-Scribner, 1883, College of Pharmacy, duplicate set.†

Frank Tweedy, 1884–91, Tweedy's private herbarium, type set; Columbia University and College of Pharmacy, duplicates.

P. A. Rydberg and C. L. Shear, 1895, Division of Agrostology, Washington, type set; Columbia University and New York Botanical Garden, duplicate sets.

P. A. Rydberg, 1896, Division of Agrostology, type set; New York Botanical Garden, complete duplicate set.

J. H. Flodman, 1896, New York Botanical Garden, type set.

Rydberg & Bessey, 1897, New York Botanical Garden, type set.

Williams & Griffith, 1898, New York Botanical Garden, some duplicates.

World's Fair Set, Montana College of Agriculture and Mechanical Arts, Bozeman, type set.

Montana Ladies' World's Fair Set, Montana College of Agriculture and Mechanical Arts, Bozeman, type set.

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* Only very small parts of these collections were made in Montana or the Yellowstone Park.

† The greater part of the type set was destroyed by fire a few years ago.

W. T. SHAW, PETER KOCH, MRS. KENNEDY, MRS. LIGHT, PROFESSOR JENNINGS and others, Montana College of Agriculture and Mechanical Arts, Bozeman, numerous specimens.

R. S. WILLIAMS, PROFESSOR AVEN NELSON, DR. BLANKINSHIP, and others, 1880–99, New York Botanical Garden.

F. D. KELSEY, F. W. ANDERSON, PROFESSOR TRAPHAGEN, DR. CHAS. H. HALL, MISS MARY COMPTON, ADDISON BROWN, BURGLEHAUS, LETTERMAN, and others, 1880–99, Columbia University.

The only important collections from Montana or the Yellowstone Park of which I have knowledge, and to which I have not had access, are the private herbarium of Rev. F. D. Kelsey and the collection made by Dr. J. N. Rose in the Yellowstone Park.

We have recently received from the Montana College of Agriculture and Mechanical Arts a number of duplicates from the herbarium of Mr. R. S. Williams, lately secured by that institution. At the time of their receipt by us the larger part of this memoir was in print, and it was therefore impossible to incorporate in it the unrecorded species found in this duplicate collection. As the additions were important it has been deemed advisable to append a list of them. It was considered unnecessary, however, to indicate the additional specimens of species already mentioned.

In the body of the catalogue are listed all specimens seen by me up to September, 1899. No species or specimen has been admitted on mere report, and only a few which I have not seen myself, and these on reliable authority. These exceptions are indicated in each case.

On the accompanying map of the state of Montana and the Yellowstone Park the localities mentioned in this catalogue at which collections have been made are indicated, with the exception of about a dozen which I have been unable to place. It will be seen from this map that the area east of the 108th meridian on the south side of the Missouri River and of the 112th meridian on the north side is practically unexplored botanically. This region includes about two-fifths of the whole state, and is made up in large part of the Great Plains, smaller mountain ranges, and the "bad lands." Its topographical features resemble those of the adjoining parts of western Dakota and northeastern Wyoming, and its flora, so far as can be determined from the limited material at hand, is almost identical with that of those states. When this portion of Montana shall be better known, many plants not included in this catalogue will doubtless be found, especially those from the prairie region which have spread into the state along the water courses. The flora of a small portion of the extreme northwestern corner around the Kootenay River is also unknown. In fact, it is only the mountain regions that have been fairly well explored.

Only new species or varieties are fully described, but as the descriptions of many others are not accessible to the general public, I have indicated the essential characters of all species not contained in Coulter's Manual, together with other notes, principally on distribution and altitude. Under each species is given the original place of publication and such references as have bearing upon the nomenclature.

In abbreviating titles to books the rules adopted by the Madison Botanical Congress have been followed with the few exceptions noted below. For the benefit of those not having access to any of the larger botanical libraries, references have been added in brackets to the most commonly used manuals where descriptions may be found; for these references it has been thought best to shorten the titles more than usual, as they occur so frequently, and the following forms were chosen:

"Man. R. M.," Coulter, Manual of the Rocky Mountain Region.
"Bot. Cal.," Brewer & Watson, Botany of California.
"Ill. Fl.," Britton & Brown, Illustrated Flora.
"Syn. Fl.," A. Gray, Synoptical Flora.

P. A. RYDBERG.

NEW YORK BOTANICAL GARDEN, February 15, 1900.

CATALOGUE OF THE FLORA OF MONTANA AND THE YELLOWSTONE NATIONAL PARK.

PTERIDOPHYTA.

OPHIOGLOSSACEAE.

Botrychium simplex Hitchcock, Amer. Journ. Sci. **6**: 103; [D. C. Eaton, Ferns of N. A. **1**: 121: Underwood, Our Nat. Ferns, 129; Man. R. M. 438; Ill. Fl. **1**: 2; Bot. Cal. **2**: 331].

In most woods, rare, at an altitude of about 2400 m. Most of Parry's specimens should be referred to var. *compositum* Lasch.

YELLOWSTONE PARK: 1873, *C. C. Parry, 306.*

* **Botrychium boreale*** (Fries) Milde, Bot. Zeit. **15**: 880 [Ferns of N. A. **1**: 37; Our Nat. Ferns, 130]; *Botrychium Lunaria* var. *boreale* Fries, Herb. Norm. **16**: 85.

This species has, as far as I know, been collected only at one station in North America, viz., on the Island of Unalaschka. It is a very rare plant, nearest related to *B. Lunaria*, but differs in the short, triangular sterile portion, which is borne very high up, close to the fertile portion.

YELLOWSTONE PARK: Pelican Creek, 1885, *Tweedy, 796.*

* **Botrychium Coulteri** Underwood, Bull. Torr. Bot. Club, **25**: 537; *Botrychium ternatum australe* Tweedy, Fl. Yell. Nat. Park 75 (name).

It is nearest related to *B. obliquum* Willd. (*B. ternatum* of American authors) of the East, but is a much stouter plant with short-petioled very fleshy leaves. It seems to be confined to the formations caused by the hot springs and geysers, at an altitude of 2000–2500 m.

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*Species preceded by an asterisk (*) are such that are not described in Coulter's Manual of the Rocky Mountain Region, the only manual that covers the region here treated.

MONTANA: Gallatin Co., *Mrs. Peter Koch.*

YELLOWSTONE PARK: 1884, *Tweedy, 6;* 1885, *797;* Lower Fire Hole Basin, 1872, *J. M. Coulter:* Lone Star Geyser Basin, August 7, 1897, *Rydberg & Bessey.*

Botrychium Virginianum (L.) Sw. Schrad. Journ. Bot. 2: 111 [Ferns of N. A. 253; Our Nat. Ferns, 132; Man. R. M., 438; Ill. Fl. **1**: 4; Bot. Cal. **2**: 332].

In rich woods, up to an altitude of perhaps 1500 m.

MONTANA: Tiger Butte, 1886, *R. S. Williams, 526.*

POLYPODIACEAE.

Woodsia Oregana D. C. Eaton, Can. Nat. **2**: 90 [Ferns of N. A. **2**: 185; Our Nat. Ferns, 120; Man. R. M. 444; Ill. Fl. **1**: 11; Bot. Cal. **2**: 348].

In shaded places among rocks, at an altitude of 1–3000 m.

MONTANA: Spanish Basin, July 9, 1896, *Flodman, 18.*

YELLOWSTONE PARK: Obsidian Cañon, 1885, *Tweedy, 795.*

Woodsia scopulina D. C. Eaton, Can. Nat. **2**: 90 [Ferns of N. A. **2**: 193; Our Nat. Ferns, 120; Man. R. M. 444; Ill. Fl. **1**: 11; Bot. Cal. **2**: 348].

In crevices of rocks, at an altitude of 1–3000 m.

MONTANA: West Boulder, 1887, *Tweedy, 90.*

YELLOWSTONE PARK: Obsidian Cliff, 1888, *Dr. Chas. H. Hall:* 1885, *Tweedy, 799;* 1883, *Miss Mary Compton:* 1873, *C. C. Parry, 303;* Upper Falls, *Adams* (Hayden Survey).

* **Woodsia obtusa** (Spreng.) Torr. Cat. Pl. in Geol. Rep. N. Y. 195 [Ferns of N. A. **2**: 189; Our Nat. Ferns, 121; Ill. Fl. **1**: 11]: *Polypodium obtusum* Spreng. Anleit. 92.

Taller than the other species: frond 15–35 cm. long; indusium cleft into broad jagged lobes. The species has never been reported from any place so far northwest. It is evidently a rare plant in the Rocky Mountain region.

MONTANA: Lower Sand Coulee, 1891, *R. S. Williams, 527.*

Cystopteris fragilis (L.) Bernh. Schrad. Neues Journ. Bot. **1**: part 2, 27 [Ferns of N. A. **2**: 49; Our Nat. Ferns, 118; Man. R. M.

444: Ill. Fl. **1**: 13; Bot. Cal. **2**: 348]; *Polypodium fragile* L. Sp. Pl. 1091.

The most common fern in Montana and the Park, growing among rocks and reaching an altitude of 3000 m.

MONTANA: Little Belt Mountain, near the pass, Aug. 10, 1895, *Flodman, 15;* Sweet Grass Cañon, Sept. 8, *17;* Madison Co., *Mrs. L. A. Fitch;* Lower Sand Coulee, 1891, *R. S. Williams, 138.*

YELLOWSTONE PARK: Black Tail Deer Creek, 1884, *Tweedy, 8;* 1888, *Dr. Chas. Hall;* 1883, *Miss Mary Compton;* Yellowstone Falls, 1873, *C. C. Parry, 302.*

Dryopteris Filix-Mas (L.) Schott, Gen. Fil. 1834 [Our Nat. Ferns, 115; Ill. Fl. **1**: 17], *Polypodium Filix-Mas* L. Sp. Pl. 1090; *Aspidium Filix-Mas* Sw. Schrad. Journ. Bot. **2**: 38 [Ferns of N. A. **1**: 311; Man. R. M. 443.]

This has been reported from Montana, but I have not seen any specimens.

* **Dryopteris spinulosa dilatata** (Hoffmann) Underwood, Our Native Ferns, 116 [Ill. Fl. **1**: 18]; *Polypodium dilatatum* Hoffm. Deutschl. Fl. **2**: 7; *Aspidium spinulosum dilatatum* Hook. Brit. Fl. 444 [Ferns of N. A. **2**: 165].

It differs from the typical *D. spinulosa* by the more numerous and larger scales of the stipe and the broader triangular fronds; the scales generally have a darker center. In rich damp woods, very rare.

MONTANA: Missoula Co., *Mrs. J. J. Kennedy.*

Polystichum Lonchitis (L.) Roth, Tent. Fl. Germ. **3**: 71; *Dryopteris Lonchitis* Kuntze, Rev. Gen. Pl. 813 [Ill. Fl. **1**: 14]: *Polypodium Lonchitis* L. Sp. Pl. 1088; *Aspidium Lonchitis* Sw.; Schrad. Jour. Bot. **2**: 30 [Ferns of N. A. **1**: 161; Our Native Ferns; Man. R. M. 444].

Among rocks, probably up to an altitude of 2000 m.; rare.

MONTANA: Park Co., 1887, *Tweedy;* East Boulder, 1887, *292;* Bozeman, 1886, *Peter Koch, 1102; Mrs. P. Koch;* Lake Terry, 1892, *R. S. Williams, 932.*

Phegopteris Dryopteris (L.) Fee, Gen. Fil. 243 [Ferns of N. A. **1**: 157; Our Native Ferns, 109; Man. R. M. 443; Ill. Fl. **1**: 19]; *Polypodium Dryopteris* L. Sp. Pl. 1093.

In rocky woods, reaching an altitude of little over 1000 m.

MONTANA: Deer Lodge Co., *Miss Emma Ware:* Columbia Falls, 1892, *R. S. Williams, 930:* Missoula, 1880, *Watson.*

Asplenium Filix-foemina (L.) Bernh.; Schrad. Neues Journ. Bot. **1**: 26 [Ferns of N. A. **2**: 225; Our Native Ferns, 107: Man. R. M. 443: Ill. Fl. **1**: 26; Bot. Cal. **2**: 344]; *Polypodium Filix-foemina* L. Sp. Pl. 1090.

Rather common in rich, damp woods, at an altitude of 1000–2500 m.

MONTANA: Sweet Grass Cañon, Sept. 5, 1896, *Flodman, 12;* West Boulder, 1887, *Tweedy, 291;* Bozeman, *W. T. Shaw;* Lewis & Clarke Co., *Mrs. Estella Muth:* Gallatin Co., *Mrs. Peter Koch:* Belt Park, 1886, *R. S. Williams, 528;* Columbia Falls, 1892, *929.*

YELLOWSTONE PARK: Broad Creek, 1885, *Tweedy, 800.*

Adiantum pedatum L. Sp. Pl. 1095 [Ferns of N. A. **1**: 135; Our Nat. Ferns, 90: Man. R. M. 442; Ill. Fl. **1**: 27; Bot. Cal. **2**: 342].

In rich woods, up to an altitude of perhaps 1500 m.

MONTANA: Deer Lodge Co., *Miss Frances Hobson:* Lake Terry, 1892, *R. S. Williams, 931.*

Cheilanthes Feéi Moore, Ind., Fil. 240; *C. gracilis* (Fee) Mett. Abh. Senck. Nat. Gesell. **3**: 36 [Our Nat. Ferns, 94; Ill. Fl. **1**: 31] not Kaulf.; *Myriopteris gracilis* Fee, Gen. Fil. 150; *Cheilanthes lanuginosa* Nutt.; Hook. Sp. Fil. 2: 99 [Man. R. M. 440; Ferns of N. A. **1**: 41].

In crevices of exposed rocks, to an altitude of 2000 m.

MONTANA: Ruby Cliffs, Madison Co., 1887, *Tweedy, 289:* Missoula Co., *Mrs. Kennedy:* Deep Creek, 1891, *R. S. Williams, 281.*

* Pellaea pumila.

Pellaea Breweri Rydberg, Cont. U. S. Nat. Herb. **3**: 535. Not Eaton.

Rootstock short and thick, densely covered with rusty hair-like scales; stipes tufted, 1–3 cm. long, dark brown, glabrous and shining, very slender, in age slightly septate; fronds 3–8, seldom 10 cm. long, oblong in outline, simply pinnate with 2–5 pairs of pinnae, dark green, shining, firm and somewhat coriaceous; pinnae in both fertile fronds oblong, about 1 cm. long, mostly obtuse, entire or the lower ones with one or two lobes at the base; indusium broad, wholly covering the sori.

In size and general habit it resembles most *P. Breweri*, but the leaves are decidedly coriaceous, the stipe more slender and less plainly septate. It has also been regarded as a depauperate form of *P. atropurpurea*, from which it differs in the smaller size, the more tufted habit, the broader pinnae of the fertile fronds, and the scarcity of hairs or scales on the stipe. In *P. atropurparea*, the pinnae of the fertile fronds are almost linear, much narrower than those of the sterile fronds. In crevices of exposed rocks. *P. atropurpurea* is most at home in more shaded places, but apparently lacking altogether in Montana.

MONTANA: Belt Mountains, 1884, *J. S. Newberry*: Silver Bow Co., *Mrs. Jennie Moore;* Tenderfoot Creek, *R. S. Williams, 241.*

It has also been collected in the following states:

WYOMING: Laramie Hills, 1896, *Aven Nelson, 1919.*

SOUTH DAKOTA: Black Hills, 1892, *Rydberg, 1191* (type).

WASHINGTON: W. Klickitat Co., 1892, *W. N. Suksdorf, 2083.*

Pteris aquilina L. Sp. Pl. 1075 [Ferns of N. A. **1**: 263; Our Nat. Ferns, 91: Man. R. M. 442; Ill. Fl. **1**: 28; Bot. Cal. **2**: 341].

In woods at an altitude of about 1000 m.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 928;* Missoula, 1898, *Williams & Griffith.*

Cryptogramma acrostichoides R. Br. in Frankl. Journ. App. 767 [Ferns of N. A. **2**: 99; Our Nat. Ferns, 97; Man. R. M. 441; Ill. Fl. **1**: 28; Bot. Cal. **2**: 341].

Among shaded rock-slides at an altitude of 2–3000 m.

MONTANA: Long Baldy, Little Belt Mts., August 19, 1896, *Flodman, 11;* East Boulder, 1887, *Tweedy, 293;* North Fork, Sun River, 1887, *R. S. Williams, 711;* Lake Plateau, 1897, *P. Koch, 35.*

YELLOWSTONE PARK: 1888, *Rev. Dr. Chas. H. Hall;* Obsidian Cañon, 1884, *Tweedy, 7;* 1883, *Miss Mary Compton;* Shoshone Lake and Lower Geyser Basin, *Coulter.*

Polypodium vulgare L. Sp. Pl. 1085 [Ferns of N. A. **1**: 237; Our Native Ferns, 82; Man. R. M. 439; Ill. Fl. **1**: 32; Bot. Cal. **2**: 334].

It is rare in Montana, growing among rocks, ascending to an altitude of a little over 1000 m.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 927.*

MARSILIACEAE.

Marsilia vestita Hook. & Grev. Ic. Fil. *pl. 159* [Man. R. M. 437; Our Native Ferns, 126; Ill. Fl. **1**: 34; Bot. Cal. **2**: 351].

In shallow water, rare, reaching an altitude of 2000 m.

MONTANA: Upper Missouri, *Geyer:* Lower Sand Coulee, 1891, *R. S. Williams, 857:* Big Blackfoot, 1880, *Watson.*

YELLOWSTONE PARK: *Coulter.*

EQUISETACEAE.

Equisetum arvense L. Sp. Pl. 1061 [Man. R. M. 445: Our Native Ferns, 133; Ill. Fl. **1**: 36; Bot. Cal. **2**: 330].

In damp places, especially in sandy soil, to an altitude of 2000 m.

MONTANA: Lewis & Clarke Co., *Mrs. Muth:* Upper Sand Coulee, 1888, *R. S. Williams, 813:* Grizzly Creek, 1887, *Tweedy, 169.*

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 801:* Yellowstone Lake, *Adams.*

* **Equisetum arvense campestre** (Schultz) Milde, Filices, 217; *E. campestre* Schultz, Fl. Starg, Suppl. **1**: 59; *E. arvense* var. *serotinum*, Meyer, Chlor. Han. 1836.

It differs from the type in the fact that it bears small spikes on the low and slender sterile shoots. It grows in muddy places up to an altitude of 2000 m.

MONTANA: Cedar Mountain, July 16, 1897, *Rydberg & Bessey.*

* **Equisetum fluviatile** L. Sp. Pl. 1062 [Ill. Fl. **1**: 37]; *E. limosum* L. Sp. Pl. 1062 [Our Native Ferns, 134].

Stems annual, all alike, with short branches and appressed sheets. It is a rare plant, growing in water.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 923.*

Equisetum robustum A. Br.; Engelm. Amer. Journ. Sci. **46**: 88 [Man. R. M. 446; Our Native Ferns, 135; Ill. Fl. **1**: 38; Bot. Cal. **2**: 330].

In rich, wet soil, especially among bushes, up to an altitude of 1500 m.

MONTANA: West Gallatin, 1892, *W. T. Shaw.*

YELLOWSTONE PARK: Hot Sulphur Springs, *Adams.*

Equisetum hyemale L. Sp. Pl. 1062 [Man. R. M. 446; Our Native Ferns, 135; Ill. Fl. **1**: 38; Bot. Cal. **2**: 331].

On river banks and in swamp lands, to an altitude of 2000 m.; rare.

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 862.*

Equisetum laevigatum A. Br.; Engelm. Amer. Journ. Sci. **46**: 871 [Man. R. M. 445; Our Native Ferns, 135; Ill. Fl. **1**: 38; Bot. Cal. **2**: 331].

Common in wet meadows to an altitude of 1500 m. It is regarded as a good hay plant.

MONTANA: East Gallatin Swamps, July 24, 1896, *Flodman, 19;* Bear Creek Cañon, 1892, *W. T. Shaw;* Cottonwood Creek, 1892, *W. T. Shaw;* Box Elder Creek, 1886, *R. S. Williams, 503;* Twin Bridges, 1892, *H. M. Fitch.*

Equisetum variegatum Schleich, Cat. Pl. Helvet. 27 [Man. R. M. 446; Our Native Ferns, 135; Ill. Fl. **1**: 39].

On river banks and other wet places up to an altitude of 2000 m.

MONTANA: Flathead River, 1892, *R. S. Williams, 922.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 804;* Lower Geyser Basin, *Coulter.*

Equisetum scirpoides Michx. Fl. Bor. Am. **2**: 281 [Man. R. M. 446; Our Native Ferns, 135: Ill. Fl. **1**: 39].

On sandy shores and bars; rare.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 921.*

SELAGINELLACEAE.

*Selaginella densa.

Densely tufted; sterile branches very short, crowded and generally incurved; leaves densely crowded and many-ranked, 3–5 mm. long, linear or in age almost needle-shaped, thickened, slightly flattened dorsally, grooved on the back, ciliate on the margin, and tipped with a white 1–2 mm. long bristle, fertile branches erect, 1–2 cm. long; bracts imbricated, 4-ranked, thick, making the branches look 4-angled, triangular-ovate, 1.5–2 mm. long, broadly triangular in cross-section, deeply grooved on the back, ciliate on the margin, and tipped with a white .3–.7 mm. long bristle.

It has been known as *S. rupestris*, but is evidently distinct from the plant of the eastern United States. Although there are scarcely any good technical characters by which to separate the two, the striking difference in habit I think is sufficient. In *S. densa*, the sterile branches are always very short, incurved, densely covered with narrower leaves. The difference between leaves and bracts is more striking.

The bristles of the former are twice as long as those of the latter, while in *S. rupestris* there is little difference if any in the length of the bristles. The grooves of the bracts are also much deeper in *S. densa* than in *S. rupestris*. The dense short sterile branches of the former, their crowded leaves, the long bristles, and the often yellowish-green color make the species look still more moss-like than its eastern ally.

S. densa grows on exposed hill-sides, among gravel or rocks throughout the Rocky Mountain Region, extending eastward to the Black Hills of Western Nebraska. The following specimens have been examined from Montana.

MONTANA: Little Rocky Mountains, 1889, *Dr. V. Havard;* Silver Bow Co., *Mrs. Jennie Moore;* Deer Lodge, *Dr. Newberry;* Park Co., 1887, *Tweedy, 172;* Wolf Creek, 1888, *R. S. Williams, 534;* Ross' Hole, 1880, *Watson;* Missoula, 1898, *Williams & Griffith.*

LYCOPODIACEAE.

Lycopodium annotinum L. Sp. Pl. 1103 [Man. R. M. 436; Our Native Ferns, 137; Ill. Fl. **1**: 42: Bot. Cal. **2**: 349].

In woods to an altitude of 2000 m.

MONTANA: Lake Terry, 1892, *R. S. Williams, 924.*

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 418;* Upper Falls, *Adams.*

ISOETACEAE.

Isoetes Bolanderi Engelm. Amer. Nat. **8**: 214 [Man. R. M. 435: Our Native Ferns, 144; Bot. Cal. **2**: 350].

In shallow water and wet shores, at an altitude of 15–2500 m.

MONTANA: East Boulder, 1887, *Tweedy, 172.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 307;* Mudflats, Yellowstone River, *C. C. Parry* (var. *Parryi*); Lewis Lake, 1884, *F. Tweedy, 57;* Yellowstone Lake, 1885, *Tweedy, 416* (?).

GYMNOSPERMAE.

PINACEAE.

Pinus flexilis James in Long's Exped. **2**: 34 [Sargent, Silva, **11**. 35; Man. R. M. 431; Bot. Cal. **2**: 124].

It is a rather rare tree, growing scattered on hillsides up to an altitude of 3000 m.

MONTANA: Bozeman, 1883, *T. S. Brandegee, 173;* Indian Creek, 1886, *Tweedy.*

YELLOWSTONE PARK: *Tweedy.*

Pinus albicaulis Engelm. in Trans. Acad. Sci. St. Louis. **2**: 209 [Silva, **11**: 35]: *Pinus flexilis albicaulis* Engelm. in Wats. Bot. Calif. **2**: 124 [Man. R. M. 432].

Not very uncommon on high hills or mountain tops at an altitude of 2000 m. or more. On alpine peaks, especially in exposed situations, it becomes much stunted, only a few feet high and with the lower branches spread flat on the ground. In these stunted individuals the wood is very hard owing to the slow growth of the tree.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey, 3528;* July 16, 1896, *Flodman, 21;* Upper Gallatin River, 1886, *F. Tweedy.*

YELLOWSTONE PARK: *Tweedy.*

Pinus ponderosa Dougl., Lawson, Man., 354 [Silva N. Am. **11**: 77; Man. R. M. 432; Ill. Fl. **1**: 51; Bot. Cal. **2**: 125].

It seems to be confined to the western slope of the Rockies and is apparently rare in Montana. It grows in rich soil and furnishes excellent lumber. It does not reach an altitude of much more than 1000 m.

MONTANA: Deer Lodge, August, 1888, *F. Tweedy, 90.*

Pinus scopulorum (Engelm.) Lemmon, Garden & Forest, **10**: 183; *Pinus ponderosa scopulorum* Engelm., Wats. Bot. Cal. **2**: 126 [Silva Am. **11**: 80; Man. R. M., 432; Ill. Fl. **1**: 51; Bot. Cal. **2**: 126].

I believe that this should rather be regarded as a distinct species, differing from *P. ponderosa* in the much shorter leaves, which are usually in twos, the short conic-ovoid cone and the rounded crown. Specimens that I have seen of *P. ponderosa* have leaves nearly twice as long as those of *P. scopulorum*, and cones which are elongated ovoid. It is also a much taller tree, growing in rich low soil, while *P. scopulorum* is always growing on dry hills or mountain sides at an elevation of 1–2000 m.

Pinus Murrayana "Oreg. Com." in Murray, Bot. Exped. Ore., 262; *Pinus contorta Murrayana* Engelm. in Wats. Bot. Cal. **2**: 126 [Silva Am. **11**: 90; Man. R. M. 433].

The Lodgepole Pine is the most common pine in the mountain regions of Western Montana and the Yellowstone Park, and next to the Douglas Fir or Red Fir the most important lumber tree of the region. As it generally is of a rather small size it is more used for wood, railroad ties, and at the mines than for lumber. The areas ravaged by forest fires are generally reforested by this pine alone, and the young trees come up so close together that they form thickets that can scarcely be penetrated. In the Yellowstone Park, the species reaches an altitude of 2500 m.

MONTANA: Spanish Basin, June 30, 1897, *Rydberg & Bessey, 3524;* Highwood Cañon, 1888, *R. S. Williams, 717:* Gallatin Co., 1886, *Tweedy.*

YELLOWSTONE PARK: *Tweedy:* Lone Star Geyser, August 7, *Rydberg & Bessey, 3525:* Yellowstone Lake, August 12, *3526;* Yellowstone Falls, August 14, *3527.*

Pinus contorta Dougl., Loudon, Arb. Frut. **4**: 2292 [Man. R. M. 432; Silva Am. **11**: 89: Bot. Cal. **2**: 126].

This species is reported as growing in Montana by Sargent, Sudworth and others. It is doubtful, however, if the true *P. contorta* really grows in the state. That species is a native of the sandy dunes of the Pacific coast, from northern California to Alaska. On dry hills, at an altitude of about 2000 m., there is growing in Montana a straggling tree, bearing cones when only a meter or two high. As these trees bear cones that are very oblique and often remain closed for years, characters that well agree with the description of *P. contorta*, they have generally been regarded as belonging to that species. To this form belong the specimens cited below. I think, however, that they may just as well represent a depauperate form of *P. Murrayana.*

MONTANA: Spanish Basin, June 26 and 28, 1897, *Rydberg & Bessey, 3522* and *3523.*

* **Larix occidentalis** Nutt. Sylva **3**: 143; Bot. Cal. **2**: 112.

It resembles the eastern Larch or Tamarack, but has cones about twice as large. It grows in cold swamps in the northwestern part of the state.

MONTANA: Mt. Haggin, Deer Lodge Co., 1888, *F. Tweedy, 91;* Missoula, 1898, *Williams & Griffith.*

~~Picea pungens~~ Engelm. in London Gard. Chron. **1879**: 334 [Man. R. M. 431]; *Abies Menziesii* Engelm. Am. Journ. Sci. II., **34**: 330. Not Lindl.

ryana

It has been reported for Montana, but no specimens have been seen by me. It is fairly common in the Yellowstone Park at an altitude of about 2000 m.

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3531*.

Picea Engelmannii Parry; Engelm. Trans. Acad. St. Louis, **2**: 212 [Man. R. M. 431].

This is the most common spruce in Montana and the Park, growing together with the Lodge Pole Pine and the Douglas Spruce in richer woods, at an altitude of 1000 to 2500 m.

MONTANA: Rea Mountains, Sept., 1884, *J. S. Newberry* (with narrow rhomboid scales); Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 3533*: Electric Peak, Aug. 20, *3532*; Madison Co., 1886, *Tweedy*; Virginia City, 1886, *Tweedy*.

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3530*; Upper Geyser Basin, Aug. 8, *3529*.

***Picea Columbiana** Lemmon, Gard. & Forest **10**: 183.

A pyramidal tree, 20–30 m. high with grayish bark; on the stem and older branches, yellowish or brownish on last year's branches, and light yellow on those of the season; branches and sterigmata perfectly glabrous and shining; the free portion of the latter about 1 mm. long and with small auricles at the base; leaves 1–2 cm. long, glaucous green, short-acute, carinate and 2-grooved on both surfaces, the carina of the upper surface slightly stronger; the cross-section is therefore somewhat irregularly rhomboid; fertile cones about 3 cm. long and 2 cm. in diameter, ellipsoid; scales broadly obovate, 1–1.5 cm. long and about 1 cm. wide, rounded at apex and irregularly erose.

In central Montana it is known as White Spruce, but it is plainly distinct from the White Spruce of eastern United States. Although the general habit and the color of the foliage are the same and the branches are perfectly glabrous in both, there is a striking difference in the form of the cones and the leaves. In *P. Canadensis* the cones are almost cylindrical; in *P. Columbiana* decidedly ellipsoid. In the former the scales are very concave and the margin almost entire: in the latter, the scales are strongly erose as in *P. Engelmannii*. In *P. Columbiana* the leaves are much more short pointed than in *P. Canadensis*. *P. Columbiana* is far more nearly related to *P. Engelmannii*, from which it differs only in the perfectly glabrous branches and sterigmata and in the less rhomboid scales of the cones.

It may be only a form of that species. *P. Canadensis* has been reported from Montana several times but I doubt its occurrence there. Probably *P. Columbiana* has been mistaken for it. The latter grows in the cañons of the mountains of central and southern Montana at an altitude of about 2000 m.

MONTANA: Jack Creek, July 15, 1897, *Rydberg & Bessey, 3534;* Emigrant Gulch, August 23, 1897, *3533*.

Pseudotsuga mucronata (Raf.) Sudworth, Cont. U. S. Nat. Herb. **3**: 266; *Abies mucronata* Raf., Atl. Journ. 120; *Pinus taxifolia* Lambert, Pinus, Ed. 1: 51. 1803; not Salisb. 1796; *Abies Douglasii* Lindl. in Penn. Cycl. **1**: 32; *Pseudotsuga Douglasii* (Lindl.) Carr. Trait. Con., Nouv. Ed. 256 [Man. R. M. 431; Bot. Cal. **2**: 120].

The Douglas Spruce or Red Fir is the most valuable lumber tree in western Montana. It is common in the mountain regions from the Big Snowies westward, and ascends to an altitude of 2500 m.

MONTANA: Spanish Basin, June 26, 1897, *Rydberg & Bessey, 3540;* Electric Peak, August 18, *3537* and *3538;* Bozeman, 1892, *W. T. Shaw;* Great Falls, 1889, *R. S. Williams, 735*.

YELLOWSTONE PARK: *Tweedy; Rydberg & Bessey*.

* **Abies grandis** Lindl., in Penn. Cycl. **1**: 30 [Bot. Cal. **2**: 118]: *Abies aromatica* Raf. in Atl. Journ. 119, 1832 (?).

Bark thin, finely checked, and dingy white although quite dark on the surface; cones narrow, 5–7.5 cm. long; male flowers yellow.

YELLOWSTONE PARK: Upper Geyser Basin, Aug. 8, 1897, *Rydberg & Bessey, 3535;* Columbia Falls, 1892, *R. S. Williams, 910*.

IDAHO: (near the border) *Isabel Mulford*.

* **Abies amabilis** (Loud.) Forb. Pinetum Wob., 125, *pl. 44: Pinus grandis* Lamb., Pinus, Ed. 1, **3**: *pl. 26*, 1837, not Lindl.; *Picea amabilis* Loud. Arb. Frut. **4**: 2342, *f. 2247–8*. 1838.

It is characterized by its reddish bark, crimson male flowers, cones 7.5–10 cm. long, leaves not twisted.

Abies lasiocarpa (Hook.) Nutt. Sylva **3**: 138; *Pinus lasiocarpa* Hook Fl. Bor. Am. **2**: 163; *Abies subalpina* Engelm.; Ward, in Amer. Nat. **10**: 555 [Man. R. M. 430].

It is a rather rare tree growing near the timber line on the higher mountains, generally among rocks, at an altitude of 2000 m. or more. As a rule it is a low and stunted tree.

MONTANA: Old Hollow-top, near Pony, July 7, 1897, *Rydberg & Bessey, 3536;* Madison Co., 1886, *Tweedy.*

YELLOWSTONE PARK: *Tweedy.*

IDAHO (near the Montana Border): *Miss Isabel Mulford.*

* **Thuja plicata** Don. Hort. Cantab. Ed. 6, 249; *Thuja gigantea* Nutt. Journ. Phila. Acad. **7**: 52 [Bot. Cal. **2**: 115].

It resembles the *T. occidentalis* L. of the East, but its cones are larger, the fertile ones with 6 or more fertile flowers. It is rare in Montana, belonging to the region west of the Rockies and growing in cold, wet woods.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 907.*

Juniperus scopulorum Sargent, Garden & Forest, **10**: 420; *Juniperus Virginiana* Coult. Man. R. M. 430, in part.

It differs from its eastern ally in having a rounded, intricately branched crown, shorter leaves and berries that require two years to mature. It grows on hillsides and in cañons up to an altitude of 2000 m.

MONTANA: Spanish Basin, June 24, 1897, *Rydberg & Bessey, 3541;* Rainbow Falls, 1887, *R. S. Williams, 734;* Middle Creek, 1886, *Tweedy, b;* Custer Co., *Mrs. Light.*

Juniperus prostrata Pers. Syn. Pl. **2**: 632: *Juniperus Sabina procumbens* Pursh, Fl. Am. Sept. 647 [Man. R. M. 430; Ill. Fl. **1**: 60].

MONTANA: Belt Mountains, 1884, *J. S. Newberry;* Belt Cañon, 1886, *R. S. Williams, 733;* Bozeman, 1892, *W. T. Shaw;* Spanish Creek, 1886, *Tweedy.*

Juniperus occidentalis Hook. Fl. Bor. Am. **2**: 166 [Man. R. M. 429; Bot. Cal. **2**: 113]; *Juniperus excelsa* Pursh, Fl. Am. Sept. 467. Not Bieb.

It has been reported from Montana but I have not seen any specimens. It is not uncommon in adjacent Idaho, growing on mountain sides at an altitude of 2500 m.

IDAHO: *Miss Isabel Mulford.*

Juniperus Sibirica Burgsdorff, Anleit. Holz. 272; *Juniperus communis montana* Ait. Hort. Kew. **3**: 414; *Juniperus nana* Willd. Sp. Pl. **4**: 854 [Ill. Fl. **1**: 60]; *Juniperus communis alpina* Gaud. Fl. Helv. **4**: 301 [Man. R. M. 429; Bot. Cal. **2**: 113]. On dry hills and mountain sides, at an altitude of 15–2500 m.

MONTANA: Jack Creek, July 15, 1897, *Rydberg & Bessey, 3542;* Belt Cañon, 1886, *R. S. Williams, 732;* Helena, 1892, *Kelsey;* Bozeman, *W. T. Shaw.*

YELLOWSTONE PARK: Lone Star Geyser, *Rydberg & Bessey, 3543.*

IDAHO: Henry's Lake, 1892, *Isabel Mulford.*

MONOCOTYLEDONES.

TYPHACEAE.

Typha latifolia L. Sp. Pl. 971 [Man. R. M. 359; Ill. Fl. **1**: 62; Bot. Cal. **2**: 188].

In swamps and slow running streams, to an altitude of 1000 m.

MONTANA: Helena, 1892, *Kelsey.*

YELLOWSTONE PARK: Head of Yellowstone Lake, *Parry.*

SPARGANIACEAE.

Sparganium eurycarpum Engelm. in Gray, Man. Ed. 2, 430 [Man. R. M. 359; Morong, Bull. Torr. Bot. Club, **15**: 76; Ill. Fl. **1**: 63; Bot. Cal. **2**: 188].

In swamps, at an altitude of less than 1500 m.

MONTANA: Manhattan, 1895, *Rydberg.*

* **Sparganium simplex multipedunculatum** Morong, Bull. Torr. Bot. Club, **15**: 79.

It differs from the type in having a more branched inflorescence with some of the lower heads peduncled. In swamps and lakes at an altitude of 1–2000 m.

MONTANA: Belt Creek, 1887, *R. S. Williams, 497;* Meadow Creek, 1886, *F. Tweedy, 1097.*

* **Sparganium natans** L. Sp. Pl. 971.

This species differs from *S. simplex* in the leaves, which are longer, floating and not at all triangular at the base. It has generally been confused with *S. simplex angustifolium* (Michx.) Engelm. It is a boreal plant and not found in the United States except in the mountain regions, where it extends south to Colorado. In the Yellowstone Park, it grows at an altitude of about 2000 m.

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 3723;* Gibbon River, 1884, *Tweedy.*

Also collected at the following localities:
ALASKA: Attu Island, 1891, *J. M. Macoun, 158.*
COLORADO: 1872, *C. C. Parry.*

* **Sparganium minimum** Fries, Summa Veg. Scand. 68 [Morong, Bull. Torr. Bot. Club, **15**: 80; Ill. Fl. **1**: 64].

In streams, perhaps ascending a little over 1000 m. in altitude.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 899.*

NAIADACEAE.

Potamogeton natans L. Sp. Pl. 126 [Man. R. M. 362; Morong, Monograph in Mem. Torr. Bot. Club, **3**: part 2, 13; Ill. Fl. **1**: 66; Bot. Cal. **2**: 195].

It is reported as growing in Montana, but I have not seen any specimens from the state. It is found in the surrounding states.

Potamogeton alpinus Balbis, Misc. Bot. 13 [Morong, Mon. 19; Ill. Fl. **1**: 68]; *Potamogeton rufescens* Schrad.: Cham. Adn. Fl. Ber. 4. 1815 [Man. R. M. 362; Bot. Cal. **2**: 195].

In streams up to an altitude of 2500 m.

MONTANA: Madison River, 1886, *Tweedy, 1104.*

YELLOWSTONE PARK: Clifford Richardson, acc. to Morong; Hot Sulphur Springs, *Adams.*

Potamogeton heterophyllus Schreb. Spicil. Fl. Lips. 21 [Morong, Mon. 23; Ill. Fl. **1**: 69]; *Potamogeton gramineus* Fries, Novit., Ed. 2, 36 [Man. R. M. 363: Bot. Cal. **2**: 196].

It differs from the preceding by its narrower, linear or linear-lanceolate submerged leaves. In still and flowing water to an altitude of 2200 m.

YELLOWSTONE PARK: Shoshone Geyser Basin, *Clifford Richardson.*

* **Potamogeton heterophyllus graminifolius** (Fries) Morong, Mon. 24 [Ill. Fl. **1**: 69]; *Potamogeton gramineus graminifolius* Fries, Novit. Ed. 2, 36.

It is distinguished by its narrow, flaccid submerged leaves.

MONTANA: Whitefish Lake, 1892, *R. S. Williams, 900.*

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 3725:* Lake, 1885, *Tweedy, 411.*

* **Potamogeton praelongus** Wulf. in Roem. Arch. **3**: 331 [Morong, Mon. 32; Ill. Fl. **1**: 71; Bot. Cal. **2**: 197].

It resembles somewhat the preceding, but lacks the floating leaves At an altitude of about 2000 m.

YELLOWSTONE PARK: *Clifford Richardson*, acc. to Morong.

* **Potamogeton foliosus** Raf. Med. Rep. II, **5**: 354 [Morong, Mon. 39: Ill. Fl. **1**: 73]; *Potamogeton pauciflorus* Pursh, Fl. Am. Sept. 121 [Bot. Cal. **2**: 197]. Not Lam.

It resembles much *P. pusillus*, but has very short spikes and peduncles, and lacks propagating buds and glands. In ponds and slow streams, up to an altitude of 2000 m.

MONTANA: Butte, July 31, 1895, *Rydberg;* Bitter-root Valley, 1880, *Watson*.

* **Potamogeton obtusifolius** Mert. & Koch, Deutschl. Fl. **1**: 855 [Morong, Mon. 40; Ill. Fl. **1**: 73]; *Potamogeton compressus* Wahl. Fl. Suec. **1**: 107.

It is characterized by its narrow, linear, obtuse leaves and free stipules. In still water up to an altitude of 2000 m.

YELLOWSTONE PARK: Shoshone Geyser Basin, *Clifford Richardson*, acc. to Morong.

* **Potamogeton diversifolius** Raf. Med. Rep. (II.) **5**: 354 [Morong, Mon. 48; Ill. Fl. **1**: 76].

It has adnate stipules as the three preceding species, but differs in the presence of floating leaves, which resemble somewhat those of *P. natans*, but are much smaller. In still water, up to an altitude of 1000 m.

MONTANA: Sand Coulee, 1891, *R. S. Williams, 853*.

Potamogeton filiformis Pers. Syn. Pl. **1**: 152 [Morong, Mon. 50: Ill. Fl. **1**: 77]; *Potamogeton marinus* Coulter, Man. R. M. 364 [Bot. Cal. **2**: 198].

In streams, at an altitude of 1000 to 2500 m. The typical form is apparently rare.

YELLOWSTONE PARK: Aug., 1884, *F. Tweedy, 230, 231*.

Potamogeton filiformis occidentalis (Robbins) Morong, Mem. Torr. Bot. Club, **3**; part 2, 51, *Potamogeton marinus occidentalis* Robbins, Bot. King Exped. 339 [Bot. Cal. **2**: 198].

This is more common than the type.

MONTANA: Bitter Root Valley, 1880, *Watson:* Missoula, 1880, *Watson*.

YELLOWSTONE PARK: Shoshone Geyser Basin, *Clifford Richardson* (acc. to Morong): Sour Creek, 1885, *Tweedy, 412*.

Potamogeton pectinatus L. Sp. Pl. 127 [Man. R. M. 364; Morong, Mon. 51; Ill. Fl. **1**: 77; Bot. Cal. **2**: 198].

In ponds and shallow lakes up to an altitude of 1000 m.

MONTANA: Great Falls, 1885, *R. S. Williams, 284*: Missoula, 1880, *Watson*.

Potamogeton Robbinsii Oakes, Hovey's Mag. **7**: 180 [Man. R. M. 364; Morong, Mon. 54; Ill. Fl. **1**: 78; Bot. Cal. **2**: 198].

It is reported by Coulter as growing in the Yellowstone Park, but I have seen no specimens from there.

Potamogeton perfoliatus L. Sp. Pl. 126 [Man. R. M. 363; Morong, Mon. 33; Ill. Fl. **1**: 71: Bot. Cal. **2**: 197].

In lakes, ponds and slow streams up to an altitude of 1000 m.

MONTANA: Missoula, 1880, *Watson*.

Potamogeton perfoliatus Richardsonii Bennett, Britten's Journ. Bot. **27**: 25 [Morong, Mon. 33; Ill. Fl. **1**: 71]: *Potamogeton perfoliatus lanceolatus* Robbins, in Gray, Man. Ed. 5, 448 [Man. R. M. 363; Bot. Cal. **2**: 197]: not Blytt.

More common than the species and reaching a higher altitude, viz., 2200 m.

MONTANA: Mystic Lake, 1897, *H. S. Jennings*.

YELLOWSTONE PARK: Lake, 1885, *Tweedy, 413*.

* **Potamogeton Zizii** Roth, Enum. **1**: 531 [Ill. Fl. **1**: 70]; *Potamogeton angustifolius* Berch. & Presl, Rost. 19 [Morong, Mon. 29]: not DC.

This is characterized by its sessile submerged leaves. It grows in lakes and streams at altitudes from 1000 to 2500 m.

MONTANA: *Hayden Survey*, acc. to Morong.

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 3724*.

Zannichellia palustris L. Sp. Pl. 969 [Man. R. M. 362; Morong, Mon. 57; Ill. Fl. **1**: 80; Bot. Cal. **2**: 193].

In pools and the shallow margins of ponds and lakes, up to an altitude of 1000 m.

MONTANA: Sand Coulee, 1891, *R. S. Williams, 533*; Madison River, 1886, *Tweedy, 1099*.

* Ruppia pectinata.

Intricately branched and very leafy; internodes very short; leaves filiform, 3–5 cm. long: stipules hyaline, 7–10 mm. long, 1–1.5 mm. wide at the base, adnate their whole length, seldom with a small round free tip: peduncles 3–5 cm. long, straight, or in fruit recurved, but apparently not spirally curved: pedicels about 1 cm. long: fruit ovoid, 1.5 mm. long, with an almost sessile stigma.

It most resembles a short-peduncled form of *R. maritima*, from which it differs in the fruit, which is smaller, not long-beaked as in that species, and not oblique. *R. occidentalis* has both the leaves and stipules much longer and the fruit is pear-shaped. *R. pectinata* somewhat resembles in habit *Potamogeton pectinatus*, hence the name. It grows in brackish ponds.

YELLOWSTONE PARK: 1884, *Tweedy, 229*.

SCHEUCHZERIACEAE.

Triglochin palustris L. Sp. Pl. 338 [Man. R. M. 364; Morong, Mon. 6; Ill. Fl. **1**: 83; Bot. Cal. **2**: 199].

In marshes, up to an altitude of 1500 m.

MONTANA: Dillon, July 7, 1895, *Rydberg*. Belt Cañon, 1886, *R. S. Williams, 363*.

Triglochin maritima L. Sp. Pl. 339 [Man. R. M. 364; Morong, Mon. 8; Ill. Fl. **1**: 83; Bot. Cal. **2**: 199].

Common in salt marshes up to an altitude of 2500 m.

MONTANA: East Gallatin Swamps, July 24, 1896, *Flodman*, August, 1887, *R. S. Williams, 651*; Boulder Creek, 1883, *Scribner, 301;* Missouri River, 1882, *Canby*.

YELLOWSTONE PARK: Hot Springs, 1884, *Tweedy, 363*, 1888, *Rev. Dr. C. H. Hall;* Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 3736*.

ALISMACEAE.

Alisma Plantago L. Sp. Pl. 342 [Ill. Fl. **1**: 85; Bot. Cal. **2**: 200] var. *Americana* Gray, Man. Ed. 2: 438 [Man. R. M. 361].

In shallow water and wet ground, up to an altitude of 1500 m., but rather rare in the region.

MONTANA: Bozeman, 1892, *Mrs. Alderson*.

Alisma Geyeri Torr. in Nicollet, Rep. Hydrog. Upper Miss. 162. 1843.

The species was discovered during the Nicollet expedition on muddy margins of ponds near Devil's Lake, N. D., but had not been found since until rediscovered by Williams in Montana. It has generally been referred to *A. Plantago*, but I think it is a distinct species. The leaves are lanceolate, tapering at both ends, about 5-ribbed. The lower portion of the petiole is much dilated and more or less scarious-margined. The scape is very short and the inflorescence scarcely exceeds the leaves. The bracts are broadly lanceolate and more or less scarious.

MONTANA: Great Falls, 1890, *R. S. Williams, 654.*

Sagittaria latifolia Willd. Sp. Pl. **4**: 409 [J. G. Smith, Mon. in Ann. Rep. Mo. Bot. Gard. **6**: 32]: *Sagittaria variabilis* Engelm. in Gray, Man. 461 [Man. R. M. 361: Bot. Cal. **2**: 201].

It is reported from Montana, but I have not seen any specimens from the state. All specimens seen which are labeled *S. variabilis* belong to the next species.

* **Sagittaria arifolia** Nutt.: J. G. Smith, Mon. in Ann. Rep. Mo. Bot. Gard. **6**: 32 [Ill. Fl. **1**: 89].

This differs from the preceding in the very short erect style, and the longer lanceolate bracts. It grows in shallow water, up to an altitude of 1500 m.

MONTANA: Great Falls, 1890, *R. S. Williams, 287;* Gallatin Co., *Mrs. Alderson;* Teton River, 1883, *Scribner, 300;* Blackfoot River, 1883, *Canby, 333.*

***Sagittaria cuneata** Sheldon, Bull. Torr. Bot. Club, **20**: 283 [J. G. Smith, Mon. 34: Ill. Fl. **1**: 89].

It is characterized by the narrow, sagittate leaves and the broad lanceolate phyllodes at the base. It grows submerged in shallow water, and ascends to an altitude of 2500 m.

MONTANA: Herbarium of Montana College of Agriculture (name of collector not given).

YELLOWSTONE PARK: Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey, 3737;* 1885, *Tweedy, 409.*

GRAMINEAE.

Andropogon scoparius Michx. Fl. Bor. Am. **1**: 57 [Man. R. M. 405; Ill. Fl. **1**: 101].

Dry hills in the plain and prairie regions to an altitude of 1500 m.

MONTANA: Smith River, 1883, *Scribner, 331.*

* **Andropogon Hallii** Hack. Sitzb. Akad. Wien, 89: 127 [Ill. Fl. 1: 101].

Like *A. furcatus*, but the joints of the rachis and pedicels pubescent with long silky hairs and the awn short and straight or none. Sand hills and badlands in the eastern part of Montana.

MONTANA: *L. F. Ward.*

YELLOWSTONE PARK: 1854, *Hayden.*

Chaetochloa glauca (L.) Scribner. Bull. U. S. Dept. Agric. Div. Agrost. 1: 39: *Panicum glaucum* L. Sp. Pl. 56; *Setaria glauca* Beauv. Agrost. 51 [Ill. Fl. 1: 126: Man. R. M. 404: Bot. Cal. 2: 260].

Introduced, especially in fields, along roads and in waste places.

MONTANA: 1883, *Scribner.*

* **Panicum pubescens** Lam. Enc. 4: 748 [Ill. Fl. 1: 121]; *Panicum dichotomum* Coult. Man. R. M. 404, in part (?).

This belongs to the *dichotomum* group and is characterized by the pubescent sheaths, leaves and spikelets. It grows in meadows up to an altitude of 1000 m.

MONTANA: Sun River Cañon, 1887, *R. S. Williams, 592.*

* **Panicum thermale** Bolander, Proc. Cal. Acad. 2: 181; *Panicum dichotomum pubescens* Tweedy, Fl. Yell. Nat. Park, 69.

It is a very near relative to the preceding, differing principally in the dense velvety pubescence, and is generally of a stunted and bunched habit. It grows in the neighborhood of the hot springs, especially in the white siliceous sand of the geyser formations, at an altitude of 2000–2500 m.

MONTANA: Warm Springs, Helena, 1892, *Kelsey.*

YELLOWSTONE PARK: Hot Springs, 1884, *Tweedy, 263;* 1885, *580:* Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 3546* and *3547:* Upper Geyser Basin, Aug. 6, *3545:* Mud Springs, 1871, *Hayden.*

Panicum capillare L. Sp. Pl. 58 [Man. R. M. 403; Ill. Fl. 1: 123; Bot. Cal. 2: 258].

In waste places, old fields, etc., in the plain regions of the state, ascending to an altitude of a little over 1000 m.

MONTANA: Custer Co., 1892, *Mrs. Light;* Missouri River, 1883, *Scribner, 328* (var. *minimum* Engl.).

Panicum barbipulvinatum Nash.

Panicum capillare brevifolium Vasey: Scribner, Bull. U. S. Dept. Agric. Div. Agrost. 5: 21: not *Panicum brevifolium* L.

Culms at length branched and rooting at the lower nodes, the upper portion below the panicle pubescent with spreading hairs: leaves confined to the base of the culm; sheaths coarsely striate, densely pubescent with spreading hairs, the hairs arising from papillae: ligule a short scarious ring; blades erect, pubescent on both surfaces with spreading hairs, sparsely so above, 4–13 cm. long, 5–10 mm. wide, lanceolate: panicle ovate, 1–2 dm. long, the lower part of the axis and the basal part of the lower branches together with the axils of all the branches pubescent with spreading hairs, the remaining portion of the axis together with the branches and their spreading divisions very rough with a hispid pubescence, the branches widely spreading, the lower ones finally reflexed: spikelets lanceolate, acuminate, appressed, on strongly hispid pedicels, 3–3.3 mm. long, glabrous; first scale clasping the base of the spikelet, a little less than one-half its length, broadly ovate, rather abruptly acute, 3-nerved, the lateral nerves converging toward the midnerve at about the middle and sometimes running into it; second and third scales 7-nerved, acute, pubescent at the very apex, the former a little exceeding the latter; fourth scale chartaceous, elliptic, about two-thirds as long as the second scale, about 1.8 mm. long and 0.7 mm. wide, obtuse at the apex.

In wet and sandy soil at an altitude of 1500 to 2500 m.

Yellowstone Park: Lower Geyser Basin, August 4, 1897, *Rydberg & Bessey, 3544* (type).

Montana: Great Falls, 1890, *R. S. Williams, 843*: Manhattan, 1895, *Rydberg, 436* (?).

Echinochloa Crus-galli (L.) Beauv. Agrost. 53; *Panicum Crus-galli* L. Sp. Pl. 56 [Man. R. M. 403; Ill. Fl. **1**: 113; Bot. Cal. **2**: 260].

In waste places, around dwellings and in neglected fields.

Montana: Ulm, 1887, *R. S. Williams, 591*.

Phalaris arundinacea L. Sp. Pl. 55 [Man. R. M. 406; Ill. Fl. **1**: 130; Bot. Cal. **2**: 265].

Common in wet meadows and sloughs, throughout the region up to an altitude of 2500 m. It makes a good, but coarse, hay.

Montana: Dillon, July 3, 1895, *C. L. Shear, 339* and *P. A. Rydberg, 2089*: Townsend, July 16, 1895, *Rydberg, 2166*: Manhattan, July 17, *C. L. Shear, 425*; East Gallatin Swamps, July 24, 1896, *Flodman, 23*; Gallatin River, 1886, *Tweedy, 1009*; Cliff Lake, July 27, 1897, *Rydberg & Bessey, 3548*; Great Falls, 1886, *R. S.*

Williams, 555: Missoula, 1880, *Watson:* Hell Gate, 1880, *Watson:* Spanish Basin, 1896, *Rydberg, 3178:* 1883, *Scribner, 332:* Swimming Women Creek, 1882, *Tweedy.*

YELLOWSTONE PARK: Lake, 1885, *Tweedy, 579.*

Savastana odorata (L.) Scribner, Mem. Torr. Bot. Club, **5**: 34 [Ill. Fl. **1**: 132]; *Holcus odoratus* L. Sp. Pl. 1048: *Hierochloa borealis* R. & S. Syst. **2**: 513 [Man. R. M. 406].

In wet places among bushes, on wooded river banks and in open woods, up to an altitude of 2000 m.

MONTANA: Manhattan, July 17, 1895, *Shear, 437,* and *Rydberg, 2184:* Logan, July 27, *Rydberg, 2511:* Great Falls, 1886, *R. S. Williams, 565;* Madison River, 1883, *Scribner, 333.*

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 648;* Yellowstone Lake, 1871, *Hayden.*

Aristida longiseta Steud. Syn. Pl. Gram. 420.

On dry hills, especially in sandy soil. It is rare in Montana, ascending to an altitude of 1500 m.

MONTANA: Madison Co., 1886, *Tweedy, 1006:* Hilgers, 1892, *Kelsey;* Belt Creek, 1883, *Scribner, 336:* Billings, 1898, *Williams & Griffith.*

Stipa Richardsoni Link, Hort. Berol. **2**: 245 [Man. R. M. 408].

Common on hill sides and dry plains, at an altitude of 1000–2500 m.

MONTANA: Silver Bow, July 8, 1895, *Shear, 357: Rydberg, 2109:* Garrison, July 8, *Shear, 371: Rydberg, 2125:* Bridger Mountains, July 28, 1896, *Flodman, 72:* Elk Mts., near Castle, Aug. 1, *73:* Jack Creek, July 14, 1897, *Rydberg & Bessey, 3549;* Bird Tail Divide, 1887, *R. S. Williams, 601:* Philipsburg, 1892, *Kelsey;* Gallatin River, 1886, *Tweedy, 1014:* Castle, 1896, *Rydberg, 3233:* Flathead, 1883, *H. B. Ayres, CXXXVI:* Little Blackfoot, *Canby, 356:* Little Belt, *Scribner, 341.*

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy, 611.*

Stipa viridula Trin. Mem. Acad. St. Petersb. (VI.) **2**: 39 [Man. R. M. 408; Ill. Fl. **1**: 138; Bot. Cal. **2**: 288].

Common in meadowland throughout the region to an altitude of 2500 m. If cut early it makes a fair hay.

MONTANA: Dillon, July 3, 1895, *Rydberg, 2087;* Gallatin, July 16–29, *Rydberg, 2180* and *2285: Shear, 528:* Manhattan, July 17, *Shear*, *413;* Elk Mts., near Castle, Aug. 1, 1896, *Flodman*, *74;* Spanish Basin, July 18, *77;* Great Falls, 1887, *R. S. Williams*, *602;* Indian Creek, July 21, 1897, *Rydberg & Bessey*, *3552;* Elk Mts., 1896, *Rydberg*, *3281;* Bozeman, 1896, *3011;* Spanish Basin, *3153;* Castle, *3258;* Elk Mts., *3307;* Little Belt Mts., *3274* and *3422;* Bull Mts., 1883, *Canby;* Smith River, 1883, *Scribner*, *340*, in part.

YELLOWSTONE PARK: 1884, *Tweedy*, *262;* Swan Creek, 1885, *609;* Agate Creek, *613;* East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey*, *3551a*.

* **Stipa Lettermani** Vasey, Bull. Torr. Bot. Club, **13**: 53: *Stipa viridula Lettermani* Vasey, Cont. U. S. Nat. Herb. **3**: 50.

Like *S. viridula* but more slender, with smaller flowers and short awn. Dry hills at an altitude of 2000 m.

MONTANA: Lima, Aug. 5, 1895, *Shear*, *595;* *Rydberg*, *2302*.

IDAHO: Beaver Cañon, Aug. 7, 1895, *Rydberg*, *2343*.

* **Stipa Vaseyi** Scribner, Bull. U. S. Dept. Agric. Div. Agrost. 11: 46: *Stipa robusta* (Vasey) Scribner, Bull. U. S. Dept. Agric. Div. Agrost. 5: 23: not Nutt.: *Stipa viridula robusta* Vasey, Cont. U. S. Nat. Herb. **3**: 50.

Resembles *S. viridula* in habit, but is a much larger plant, 16–20 dm. high. It has been reported from Montana. I have not seen any specimens from the state, but the following were collected just across the border.

IDAHO: Beaver Cañon, June 27, *Shear*, *301;* Aug. 7, *Rydberg*, *2345*.

* **Stipa Williamsii** Scribner, Bull. U. S. Dept. Agric. Div. Agrost. 11: 45. 1898.

It is distinguished from *S. viridula* by the hairy culm and sheaths and its longer and more acute callus. In dry soil at an altitude of about 2000 m.

MONTANA: Jefferson City, 1883, *Scribner*, *340*, in part.

* **Stipa Elmeri** Piper & Brodie; Scribner, Bull. U. S. Dept. Agric. Div. Agrost. 11: 46, 1898: *Stipa viridula pubescens* Vasey, Cont. U. S. Nat. Herb. **3**: 50; not *S. pubescens* R. Br.

Distinguished from *S. viridula*, which it resembles, by the hairy culm and sheaths, and by the awns, which are pubescent to the second joint.

In wet meadows at an altitude of 2000 m.

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3551*.

Stipa comata Trin. & Rupr. Mem. Acad. St. Petersb. (VI.) **5**: 75 [Man. R. M. 408: Ill. Fl. **1**: 138; Bot. Cal. **2**: 285].

Common on prairies, plains and dry meadows, especially in sandy soil, up to an altitude of 2000 m.

MONTANA: Dillon, July 3, 1895, *C. L. Shear, 334* and *Rydberg, 2078;* Manhattan, July 17, *Shear, 350* and *433: Rydberg, 2195;* Spanish Basin, July 20, 1896, *Flodman, 71:* Great Falls, 1887, *R. S. Williams, 603:* Bozeman, 1886, *Tweedy, 1015:* Pony, July 6, 1897, *Rydberg & Bessey, 3550:* Spanish Basin, 1896, *Rydberg, 3152* and *3156* (?): Lewis and Clarke Co., *Mrs. E. Muth:* Flathead Region, 1883, *H. B. Ayres:* Smith River, 1883, *Scribner, 337;* Jefferson City, *338*.

* **Stipa Tweedyi** Scribn. Bull. U. S. Dept. Agric. Div. Agrost. **11**: 47; *Stipa comata intermedia* Scribn. Bot. Gaz. **11**: 171; not *S. intermedia* Trin.

It very closely resembles *S. comata*, but the spikelets and awns are much longer, and approaches *S. spartea* in size. At an altitude of 2000–2500 m.

YELLOWSTONE PARK: Junction Butte, 1885, *Tweedy, 610*.

MONTANA: Jefferson City, 1883, *Scribner*.

Stipa spartea Trin. Mem. Acad. St. Petersb. (VI.) **1**: 82 [Man. R. M. 408; Ill. Fl. **1**: 139].

Rare, on prairies, not reaching an altitude of 1500 m.

MONTANA: Horned Creek, 1883, *Scribner, 339*.

* **Oryzopsis asperifolia** Michx. Fl. Bor. Am. **1**: 51 [Ill. Fl. **1**: 140].

An eastern species characterized by the large spikelets, 6–8 mm. long, and the long narrow leaves crowded at the base. In woods at an altitude of 1000–2500 m.

MONTANA: Flathead Valley, 1883, *Canby, 357*.

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 615*.

* **Oryzopsis exigua** Thurb. Bot. U. S. Explor. Exped. **17**: 481.

It somewhat resembles the preceding, but the spikelets are smaller, about 4 mm. long; it is still nearer related to the eastern *O. juncea*, from which it differs in the more simple panicle, the less pubescent flowering glumes and the longer awn. It grows in open woods at an altitude of 2000–2500 m.

MONTANA: Neihart, 1888, *R. S. Williams, 816;* Spanish Basin, June 28, 1897, *Rydberg & Bessey, 3553;* McDonald's Peak, 1883, *Canby, 358.*

YELLOWSTONE PARK: Slough Creek, 1885. *Tweedy, 614.*

Oryzopsis micrantha (Trin. & Rupr.) Thurb. Proc. Phila. Acad. **1863**: 78 [Man. R. M. 408; Ill. Fl. **1**: 140]; *Urachne micrantha* Trin. & Rupr. Mem. Acad. St. Petersb. (VI.) **5**: 16.

In cañons and on wooded hill sides up to an altitude of 2000 m.

MONTANA: Lower Sand Coulee, 1890, *R. S. Williams, 815;* Indian Creek, 1883, *Scribner, 343;* Billings, 1898, *Williams & Griffith.*

Eriocoma cuspidata Nutt. Gen. **1**: 40 [Bot. Cal. **2**: 283]; *Oryzopsis cuspidata* Benth.; Vasey, Special Rep. U. S. Dept. Agric. **63**: 23 [Man. R. M. 408: Ill. Fl. **1**: 141].

In loose, especially sandy, soil up to an altitude of 2000 m. At Manhattan I found it, as a troublesome weed in an oat field in 1895.

MONTANA: Billings, 1898, *Williams & Griffith:* Melrose, 1895, *Shear, 349;* Manhattan, *Shear, 432; Rydberg, 2194:* Cottonwood Creek, 1896, *Flodman, 43;* Custer Co., 1892, *Mrs. Light;* Great Falls, 1891, *R. S. Williams, 563;* Bozeman, 1887, *Tweedy;* Cottonwood Creek, 1898, *Rydberg, 3232;* Lewis and Clarke Co., *Mrs. Muth;* Gallatin City, 1883, *Scribner, 344.*

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 582;* Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 3554.*

* **Eriocoma caduca** (Scribner): *Stipa caduca* Scribner: Vasey, Cont. U. S. Nat. Herb. **3**: 54. 1892.

Although somewhat resembling a *Stipa* in general habit, I think that it should be referred to *Eriocoma*, for the awn, although long as in *Stipa*, is early deciduous: the spikelet is not constricted at the base so that there is no evident callus: it is covered all over with long white hairs: and the empty glumes are of that thin, scarious type characteristic of *Eriocoma cuspidata.* The spikelet is, of course, more acute at both ends than in the type of *Eriocoma*, but much less so than in *E. Webberi.* In my opinion, it is much more related to *E. cuspidata* than is that species, notwithstanding the long awn.

MONTANA: Sixteen Mile Creek, 1883, *Scribner, 342.*

* **Muhlenbergia racemosa** (Michx.) B.S.P. Prel. Cat. N. Y. 67 [Ill. Fl. **1**: 143]; *Agrostis racemosa* Michx. Fl. Bor. Am. **1**: 53: *Muhlenbergia glomerata* Trin. Unifl. 191.

This somewhat resembles the next in general habit, but lacks the awn and the hairs at the base of the floret. Along railroads and in waste places to an altitude of 1500 m. It has the appearance of an introduced plant.

MONTANA: Gallatin, along the railroad, 1895, *Shear, 527: Rydberg, 2286:* Missouri River and Smith River, 1883, *Scribner, 345:* Belt River, 1887, *R. S. Williams, 585.*

Muhlenbergia comata (Thurb.) Benth.; Vasey, Cat. Grasses of U. S. 39 [Ill. Fl. **1**: 144: Man. R. M. 409]: *Vaseya comata* Thurber, Proc. Phila. Acad. **1863**: 79 [Bot. Cal. **2**: 278].

In meadows, on river banks, etc., to an altitude of 2000 m.

MONTANA: Great Falls, 1891, *R. S. Williams, 826:* Yogo, 1896, *Rydberg, 3411.*

YELLOWSTONE PARK: Upper Madison Cañon, Aug. 3, 1897, *Rydberg & Bessey, 3555.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 3556.*

Phleum alpinum L. Sp. Pl. 59 [Man. R. M. 410: Ill. Fl. **1**: 148; Bot. Cal. **2**: 263].

Common in alpine meadows and along brooks, at an altitude of 2000–3000 m.

MONTANA: Lima, Aug. 6, 1895, *Shear, 555: Rydberg, 2311;* Mystic Lake, July 25, *Shear, 494: Rydberg, 2249:* Spanish Basin, July 11, 1896, *Flodman, 61* and *62:* July 17, *65:* Bridger Mountains, July 28, *66;* Spanish Basin, July 1, 1897, *Rydberg & Bessey, 3558:* West Gallatin, 1883, *Scribner, 346:* Trout Creek, 1891, *R. S. Williams, 610:* Spanish Basin, 1896, *Rydberg, 3042:* Bridger Mts., *3217:* Little Belt Mts., *3324:* Belt Mts., 1883, *Scribner, 346.*

IDAHO: Henry's Lake, July 31, *Rydberg & Bessey, 3557.*

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, *Rydberg & Bessey, 3559:* 1885, *Tweedy, 649.*

Phleum pratense L. Sp. Pl. 59 [Man. R. M. 410; Ill. Fl. **1**: 147; Bot. Cal. **2**: 262].

Extensively cultivated in Montana, and perfectly naturalized in wet meadows and along streams, up to an altitude of 2000 m.

MONTANA: Deer Lodge, July 9, 1895, *Rydberg, 2132:* Manhattan, July 17, *Shear, 414:* Townsend, July 17, *Shear, 434** : Helena, near Broadwater Warm Springs, July 13, *Rydberg, 2149:* Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 3560:* Ross' Hole, 1880, *Watson*; Madison Co., *Mrs. McNulty:* Fort Logan, 1883, *Scribner, 347.*

* **Alopecurus geniculatus** L. Sp. Pl. 60 [Ill. Fl. **1**: 149; Bot. Cal. **2**: 263].

The typical form with awns that are much longer than the glumes is very rare in Montana. The following variety, with awns that slightly, if at all, exceed the glumes, is more common.

MONTANA: Lower Sand Coulee, 1891, *R. S. Williams, 820.*

Alopecurus geniculatus fulvus (J. E. Smith) Scribner, Mem. Torr. Bot. Club, **5**: 38; *Alopecurus fulvus* J. E. Smith, Engl. Bot. 1467: *Alopecurus aristulatus* Michx. Fl. Bor. Am. **1**: 43 [Man. R. M. 407: Bot. Cal. **2**: 263].

It is common in wet places, especially on sandy shores of lakes and rivers, and around springs, and extends into the mountains to an altitude of 2200 m.

MONTANA: Spanish Basin, 1896, *Rydberg, 3154:* Bozeman Cañon, 1895, *Shear, 498: Rydberg, 2222:* Dillon, July 3, *Shear, 337:* Red Rock, *Shear, 328:* Logan, July 27, *508:* Spanish Basin, July 22, 1896, *Flodman, 42:* Bozeman, 1887, *Tweedy*; 1883, *Scribner, 334:* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 3567:* Helena, 1890, *Kelsey:* Great Falls, 1890, *Williams, 611;* Snowy Mts., 1882, *Canby.*

YELLOWSTONE PARK: Cache Creek, 1885, *Tweedy, 592:* Turbid Lake, *592:* Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 3561.*

Alopecurus occidentalis Scribner & Tweedy, Bot. Gaz. **11**: 170; *Alopecurus pratensis alpestris* Vasey, Cont. U. S. Nat. Herb. **3**: 86: not *A. alpestre* Wahl. *A. alpinus* Port. & Coult. Fl. Colo. 251 [Man. R. M. 406]; not Smith.

It is a taller plant than *A. alpinus*, has longer spikes, larger spikelets, 4–5 mm. long, and a short awn attached near the base of the glume, and is common in wet meadows, at an altitude of 1500–2500 m. It is an excellent hay-grass, and is without doubt worthy of cultivation.

MONTANA: Deer Lodge, 1895, *Shear, 352: Rydberg, 2115;* Elk

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* Intermediate between this and *P. alpinum.*

Mts., near Black Hawk, Aug. 5, 1896, *Flodman, 38* and *39:* Trout Creek, 1891, *R. S. Williams, 835:* Silver Bow Co., 1888, *Tweedy, 133:* 1883, *Scribner, 335;* Spanish Basin, 1896, *Rydberg, 3043;* Elk Mountains, *3268;* July 26, 1897, *Rydberg & Bessey, 3562;* Rock Creek, Belt Mts., 1883, *Scribner, 335:* Helena, 1883, *Canby, 354;* Big Hole Valley, 1880, *Watson.*

YELLOWSTONE PARK: Mirror Lake, 1885, *Tweedy, 591:* East Fork of Yellowstone, *581.*

Sporobolus cuspidatus (Torr.) Wood, Bot. & Florist, 385 [Man. R. M. 411; Ill. Fl. **1**: 153]; *Vilfa cuspidata* Torr.; Hook. Fl. Bor. Am. **2**: 238.

This is a grass that belongs to the plain and prairie regions, and in Montana scarcely reaches the foot of the mountains.

MONTANA: 1883, *Scribner, 350.*

Sporobolus brevifolius (Nutt.) Nash, Bull. Torr. Bot. Club, **22**: 464; not Scribn. [Ill. Fl. **1**: 153]: *Agrostis brevifolia* Nutt. **1**: 44; *Sporobolus depauperatus* Coulter, Man. 411, in part.

Rather common in meadows, at an altitude of 1500–2000 m.

MONTANA: Manhattan, 1895, *Shear, 410: Rydberg, 2171:* Dillon, *Shear, 333: Rydberg, 2081:* Melrose, *Shear, 342: Rydberg, 2095;* Madison River, *Shear, 524: Rydberg, 2276:* Yogo Baldy, Little Belt Mts., 1896, *Flodman, 68:* Long Baldy, Aug. 19, *70:* Spanish Basin, July 20, *67:* Helena, 1892, *F. D. Kelsey:* 1883, *Scribner, 351:* Forks of Madison, July 26, 1897, *Rydberg & Bessey, 3564;* Spanish Basin, 1896, *Rydberg, 3162* and *3166:* Judith River, 1896, *Rydberg, 3430;* Musselshell River, *3433* and *3436;* Running Wolf Creek, *3404:* Judith Gap, 1882, *R. W. Springer, XVIII;* Flathead Region, 1883, *H. B. Ayres:* Sheep Creek, 1883, *Scribner, 351;* Madison Valley, 1871, *Hayden:* Fort Logan, 1882, *Canby.*

YELLOWSTONE PARK: Lake, 1885, *Tweedy, 590.*

Sporobolus depauperatus (Torr.) Scribner, Bull. Torr. Bot. Club, **9**: 103 [Man. R. M. 411]; *Vilfa depauperata* Torr.; Hook. Fl. Bor. Am. **2**: 257 [Bot. Cal. **2**: 267].

Closely allied to the preceding and by most botanists regarded as only a depauperate form thereof, but a knowledge of the two in the field has persuaded me that they are distinct. *S. depauperatus* has shorter spikelets and grows in very dense tufts: most of the branches are prostrate, only the upper portion of the flower-bearing ones becoming erect and seldom 1 dm. high. *S. brevifolius* is rarely much tufted, the stems often 2–3 dm. high and mostly erect. *S. depauperatus* grows in poor soil to an altitude of 2000 m.

MONTANA: Logan, 1895, *Shear, 516:* Butte, *Rydberg, 2297.*

* **Sporobolus filiformis** (Thurber) Rydb. Cont. U. S. Nat. Herb. **3**: 189; *Vilfa depauperata filiformis* Thurb.; Wats. Bot. King's Exp. **5**: 376; *Vilfa gracillima* Thurber, Bot. Cal. **2**: 268.

Distinguished from the preceding by the annual root, the small size, the fewer-flowered panicle and the smaller flowers. On sandy shores at an altitude of 2300 m.

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 3681;* Upper Falls of Yellowstone, 1871, *Hayden, 5.*

Sporobolus confusus Vasey, Bull. Torr. Bot. Club, **1**: 293; Cont. U. S. Nat. Herb. **3**: 64; *Sporobolus ramulosus* Thurber, Bot. Cal. **2**: 269 [Man. R. M. 411]; not *Vilfa ramulosa* H.B.K.

This is a rather rare grass, growing in sandy soil, at an altitude of 1500–2000 m.

MONTANA: Logan, 1895, *Shear, 501; Rydberg, 2264:* Melrose, *2291.*

Sporobolus asperifolius Nees & Meyen, Nov. Act. Nat. Cur. **19**: Suppl. 1, 141 [Man. R. M. 412; Ill. Fl. **1**: 156].

In meadow land, especially in sandy ground, up to an altitude of 2000 m.

MONTANA: Townsend, 1895, *Shear, 405: Rydberg, 2170;* Logan, *Shear, 526:* Gallatin, *531;* Melrose, *534;* Jack Creek, July 19, 1897, *Rydberg & Bessey, 3565:* 1883, *Scribner, 352:* Great Falls, 1886, *R. S. Williams, 557;* East Gallatin, 1896, *Rydberg, 3192;* Musselshell River, *3438;* Missouri River, 1883, *Scribner, 352;* Snowy Mountains, 1882, *Canby:* Billings, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: Hot Sulphur Springs, 1871, *Hayden.*

Sporobolus airoides Torr. Pac. R. R. Rep. **7**: part 3, 21 [Man. R. M. 411; Ill. Fl. **1**: 155]; *Agrostis airoides* Torr. Ann. Lyc. N. Y. **1**: 151.

It grows in dense and hard bunches on dry prairies and plains, extending in the valleys up to an altitude of 2000 m.

MONTANA: Dillon, 1895, *Rydberg, 2077:* Melrose, July 6, *Shear, 346:* Townsend, *Shear, 396: Rydberg, 2155:* Helena, 1892, *Kelsey:* Jack Creek, July 19, 1897, *Rydberg & Bessey, 3566;* East Gallatin Swamp, 1896, *Rydberg, 3188:* Townsend, 1883, *Scribner, 348:* Billings, 1898, *Williams & Griffith.*

Sporobolus cryptandrus (Torr.) A. Gray, Man. 576 [Man. R. M. 411: Ill. Fl. **1**: 155: Bot. Cal. **2**: 268]: *Agrostis cryptandra* Torr. Ann. Lyc. N. Y. **1**: 151.

On river banks up to an altitude of 1800 m.

MONTANA: Melrose, 1895, *Shear, 536:* Great Falls, 1890, *R. S. Williams, 609:* Missouri River, 1883, *Scribner, 349:* Billings, 1898, *Williams & Griffith.*

* **Polypogon Monspeliensis** (L.) Desf. Fl. Alt. **1**: 67 [Ill. Fl. **1**: 157: Bot. Cal. **2**: 270]: *Alopecurus Monspeliensis* L. Sp. Pl. 89.

A grass resembling *Alopecurus* in general habit but the two empty glumes with long awns. It is very rare in Montana.

MONTANA: Helena, 1891, *Kelsey.*

Cinna latifolia (Trev.) Griseb.; Ledeb. Fl. Ross. **4**: 435 [Ill. Fl. **1**: 158]: *Agrostis latifolia* Trev.: Goeppert, Beschr. d. Bot. Gart. Breslau, 82, 1830; *Cinna pendula* Trin. Mem. Acad. St. Petersb. (VI.) **6**: 280: *Cinna arundinacea pendula* Gray, Man. Ed. **2**: 545 [Man. R. M. 413; Bot. Cal. **2**: 276].

In damp woods, ascending in the mountains to an altitude of 2000 m.

MONTANA: Helena, 1895, *Rydberg, 2139:* Little Belt Mts., near Barker, 1896, *Flodman, 60:* Tenderfoot, 1890, *R. S. Williams, 822;* Little Belt Mountains, 1896, *Rydberg, 3364:* East Gallatin Swamps, *3167;* Jack Creek, 1897, *Rydberg & Bessey, 3568:* Spanish Basin, *3563:* Emigrant Gulch, *3569:* Ray Creek, 1883, *Scribner, 357;* Missoula, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 581.*

Agrostis alba L. Sp. Pl. 63 [Man. R. M. 412; Ill. Fl. **1**: 159: Bot. Cal. **2**: 271]: *Agrostis vulgaris* With. Bot. Arr. Brit. Pl. Ed. 3, 132.

The red-top is one of the most common and most valuable forage grasses of Montana, and grows in wet meadows up to an altitude of 2000 m.

MONTANA: Helena, 1895, *Shear, 384: Rydberg, 2137* and *2138;*

Manhattan, *Shear*, *435*; Logan, *504*; *Rydberg*, *2269* and *2349*; Melrose, *Shear*, *543*; *Rydberg*, *2294*; Madison River, *2281* and *2282*; Little Belt Mts., near Barker, 1896, *Flodman*, *35*; Great Falls, 1890, *R. S. Williams*, *844*; Helena, 1892, *Kelsey*; Spanish Basin, 1896, *Rydberg*, *3159*, *3180* and *3187½*; Castle, *3242*; Little Belt Mountain, *3349*; Missoula Co., *Mrs. Kennedy*; Spanish Basin, 1896, *Flodman*, *34* (?): Fort Shaw, 1883, *Scribner*, *356*.

* **Agrostis humilis** Vasey, Bull. Torr. Bot. Club, **10**: 21; Cont. U. S. Nat. Herb. **3**: 77.

It is related to *A. alba*, but is much smaller, only 1–2 dm. high, and with a narrow panicle. River banks at an altitude of 1500–2000 m.

MONTANA: Park Co., 1887, *Tweedy*.

YELLOWSTONE PARK: 1884, *Tweedy*, *259* and *603*.

***Agrostis aequivalvis** Trin. Mem. Acad. St. Petersb. (VI.) 6^2: 362 [Vasey, Cont. U. S. Nat. Herb. **3**: 77: Bot. Cal. **2**: 271]; *Deyeuxia aequivalvis* Benth. Journ. Linn. Soc. **19**: 91.

A species with a narrow panicle belonging to the *alba* group, *i. e.*, with the palet present, and this almost as long as its glume. The flowers have a small hairy rudiment at the base, the plant therefore approaching *Calamagrostis*. It is a very rare grass in Montana.

MONTANA: East Fork of Gallatin, 1886, *Tweedy*, *1019*.

Agrostis asperifolia Trin. Mem. Acad. St. Petersb. (VI.) 6^2: 317; *Agrostis exarata* Thurber, Bot. Cal. 2: 273, in part [Man. R. M. 412, in part].

Like *A. exarata*, but with smaller spikelets, denser panicle and very scabrous leaves. River banks at an altitude of 1000–2500 m.

MONTANA: Elk Mts., near Black Hawk, 1896, *Flodman*, *32*; Spanish Basin, 1896, *31*; 1883, *Scribner*, *353*; Spanish Basin, 1896, *Rydberg*, *3119*; Elk Mountains, *3255*, *3260* and *3275*; Judith River, *3432*; Cedar Mountains, July 16, 1897, *Rydberg & Bessey*, *3580*; Tobacco Plains, 1883, *H. B. Ayres*, *CCCVI*; Horned Creek, 1883, *Scribner*, *354*.

YELLOWSTONE PARK: Pelican Creek, 1885, *Tweedy*, *604*; Lone Star, Aug. 7, 1897, *Rydberg & Bessey*, *3581*.

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey*, *3579* and *3582*.

Agrostis grandis Trin. Mem. Acad. St. Petersb. (VI.) 6^2: 316.

This differs from *A. exarata* in the very large open panicle. It occurs along streams at an altitude of about 1500 m.

MONTANA: Missouri Valley, 1883, *Scribner, 353*.

***Agrostis variabilis**; *Agrostis varians* Trin. Mem. Acad. St. Petersb. (VI.) 6: 314. 1845: not Tuill. 1790 [Vasey, Cont. U. S. Nat. Herb. **3**: 73: Bot. Cal. **2**: 273].

A small species 3–8 cm. high, with the palet very small or wanting, a small narrow panicle and subequal empty glumes. It is a rare plant, growing in wet meadows at an altitude of 2700 m.

YELLOWSTONE PARK: Mirror Lake, 1885, *Tweedy, 605;* East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3570*.

***Agrostis tenuiculmis recta** Nash; *Agrostis tenuis erecta* Vasey, MMS.; not *A. erecta* Spreng.

Agrostis tenuis Vasey, Bull. Torr. Bot. Club, **10**: 21, is antedated by *A. tenuis* Sibt. 1794, consequently both the specific and the varietal name must be changed. It is a small plant with a small panicle and erect or ascending rays, and no palet. In wet places at an altitude of 2000–3000 m.

MONTANA: Little Belt Mountains, 1896, *Flodman, 24: Rydberg, 3327½*.

YELLOWSTONE PARK: East De Lacy's Creek, 1897, *Rydberg & Bessey, 3571:* East Fork, 1885, *Tweedy, 606*.

Agrostis hyemalis (Walt.) B.S.P. Prel. Cat. N. Y. 68 [Ill. Fl. **1**: 161]; *Cornucopiae hyemalis* Walt. Fl. Car. 73: *Agrostis scabra* Willd. Sp. Pl. **1**: 370 [Man. R. M. 412; Bot. Cal. **2**: 275].

A common grass growing in sandy soil to an altitude of 2000 m.

MONTANA: Gallatin, 1895, *Rydberg, 2288:* Manhatten, *Shear, 407* and *423: Rydberg, 2173:* Helena, *2142:* Sweet Grass Cañon, 1896, *Flodman, 30:* Spanish Basin, *Rydberg, 3044, 3105, 3076, 3013:* Grasshopper Cañon, 1880: *Watson*, 1883, *Scribner, 355:* Cedar Mountain, 1897, *Rydberg & Bessey, 3578*.

YELLOWSTONE PARK: 1873, *C. C. Parry, 292;* 1884, *Tweedy, 258, 606, 607, 608;* 1871, *Hayden;* Lower Geyser Basin, 1897, *Rydberg & Bessey, 3574:* Lower Geyser Basin, *3577*.

On river banks at low altitudes, there occurs a form with very large panicle and broad flat leaves. It is very unlike the typical *A. hyemalis* in habit, but no essential differences in the flowers, etc., can be found. It may be distinct but it is rather unsafe to separate it until it is better known. The following specimens belong here:

MONTANA: Bozeman, 1895, *Shear*, *457*: *Rydberg*, *2218* and *2221*; Townsend, July 15, *2151*; Logan, *Shear*, *510*; Alhambra, 1888, *Kelsey*; Musselshell River, 1896, *Rydberg*, *3435*: Sweet Grass Cañon, *3442*; Cliff Lake, 1897, *Rydberg & Bessey*, *3573*.

YELLOWSTONE PARK: Mud Springs, 1871, *Hayden*; East De Lacy's Creek, 1897, *Rydberg & Bessey*, *3577*; Upper Madison, *3575*.

At high altitudes, 2500 m. or more, in cañons and on mountain tops, there is found a form with short tufted leaves and small panicles. To this belong the following specimens:

MONTANA: Long Baldy, Little Belt Mts., Aug. 19, 1896, *Flodman*, *28*; *Rydberg*, *3390*; Belt Mts., 1886, *F. W. Anderson*: Sweet Grass Cañon, 1896, *Rydberg*, *3444*.

Calamagrostis purpurascens R. Br.; Richards. Frankl. Journ. 731; Kearney, Bull. U. S. Dept. Agric. Div. Agrost. 11: 19; *Calamagrostis sylvatica* Gray, Proc. Am. Acad. **6**: 80 [Bot. Cal. **2**: 182]; not DC.; *Deyeuxia sylvatica* Vasey, Descr. Cat. Grasses U. S. 51 [Man. R. M. 414].

A subalpine species, growing in big bunches on open ridges and mountain sides at an altitude of 2000–3000 m.

MONTANA: Baldy, near Bozeman, 1895, *Shear*, *468*; *Rydberg*, *2224*; Elk Mts., near Black Hawk, 1896, *Flodman*, *56*; Little Belt Mts., near the pass, *57*; Belt Cañon, 1887, *R. S. Williams*, *596*: White Sulphur Springs, 1883, *Scribner*, *362*; Spanish Creek, *Tweedy*, *1022*; Little Belt Mts., 1896, *Rydberg*, *3313½* and *3373*; Spanish Peaks, *3074*; Elk Mountains, *3296*: Blackfoot River, 1883, *Canby*, *362*; Flathead Region, *H. B. Ayres*.

* **Calamagrostis Montanensis** Scribn. Vasey, Contr. U. S. Nat. Herb. **3**: 82 [Kearney, Bull. U. S. Dept. Agric. Div. Agrost. 11: 20].

A low species with almost filiform leaves, strongly compressed spikelets, sharply keeled empty glumes, and a stout bent awn which about equals the empty glumes. It grows on dry bench lands up to an altitude of 2000 m.

MONTANA: Columbia Falls, 1894, *R. S. Williams*, *846*; Sixteen Mile Creek, 1883, *Scribner*, *363*; Grasshopper Valley, 1880, *Watson*; Judith Gap, 1882, *R. W. Springer*, *XXIV*.

* **Calamagrostis Suksdorfii** Scribn. Cont. U. S. Nat. Herb. **3**: 82 [Kearney, Bull. U. S. Dept. Agric. Div. Agrost. 11 : 24]; *Deyeuxia Suksdorfii* Scrib. Bull. Torr. Bot. Club, **15**: 9.

A grass growing in big bunches in the woods at an altitude of 1500–2000 m. It has a bent awn, a little longer than the empty glumes. The spikelets are not strongly compressed.

MONTANA: Bozeman Cañon, 1895, *Rydberg, 2230;* Little Belt Mts., near Barker, 1896. *Flodman, 55:* Smith River, 1883, *Scribner, 364* (type); 1894. *R. S. Williams, 1050:* Glendive, 1892, *E. A. Ross;* Little Belt Mountains, 1896, *Rydberg, 3346. 3359* and *3384.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1892, *Miss Mulford.*

* **Calamagrostis blanda** Beal, Grasses N. Am. **2**: 349; *Calamagrostis pallida* Vasey & Scribner, Cont. U. S. Nat. Herb. **3**: 79.

Nearly related to *C. Canadensis*, but distinguished by its pale whitish panicle, with usually flexuous branches, narrower and sharper pointed empty glumes, and an awn attached near the apex and usually considerably longer than the flowering glumes. It grows among bushes at an altitude of about 2000 m.

MONTANA: Helena, 1895, *Rydberg, 2139½;* Castle, 1896, *3238.*

Calamagrostis Langsdorfii (Link) Trin. Unifl. 225 [Ill. Fl. **1**: 164; Bot. Cal. **2**: 279]; *Arundo Langsdorfii* Link, Enum. **1**: 74; *Deyeuxia Langsdorfii* [Man. R. M. 413].

Very rare within the region. The only specimen seen which may be referred to it is the following:

YELLOWSTONE PARK: 1884, *Tweedy, 248.*

Calamagrostis Canadensis (Michx.) Beauv. Agrost. 157 [Ill. Fl. **1**: 163: Bot. Cal. **2**: 279]; *Agrostis Canadensis* Michx. Fl. Bor. Am. **1**: 73; *Deyeuxia Canadensis* Munro: Hook. f. Trans. Linn. Soc. **23**: 345 [Man. R. M. 413].

Common in wet meadows, along streams, etc., to an altitude of 2000 m.

MONTANA: Manhattan, *Shear, 417:* Logan, *519: Rydberg, 2278;* Spanish Basin, 1896, *Flodman, 48:* East Gallatin Swamps, *49;* 1883, *Scribner, 359:* Gallatin Co., 1886, *Tweedy, 1023:* Columbia Falls, 1894, *R. S. Williams:* East Gallatin Swamps, 1896, *Rydberg, 3202.*

YELLOWSTONE PARK: 1885. *Tweedy, 584.*

* **Calamagrostis Canadensis acuminata** Vasey, Bull. U. S. Dept. Agric. Div. Agrost. 5 : 26 [Kearney, Bull. 11 : 29].

Spikelets 3.5–4 mm. long; empty glumes sharply acuminate. It approaches *C. Langsdorfii*, from which it differs in the smaller spikelets and shorter awns. It grows in similar situations as the species and is fully as common, and reaches an altitude of 2500 m.

MONTANA: Manhattan, 1895, *Shear*, *419* and *424; Rydberg*, *2189;* Spanish Basin, 1896, *Flodman*, *59;* Elk Mts., near Castle, *54;* Deep Creek, 1883, *Scribner*, *358;* Beaver Creek, *226;* Lima, 1895, *Shear*, *553;* East Gallatin Swamps, 1896, *Rydberg*, *3202;* Castle, *3235;* Yogo Gulch, *3408;* Bridger Cañon, *3205;* Spanish Creek, *3016*, *3024*, *3049*, *3073:* Little Belt Mts., *3358*, *3333;* Spanish Basin, 1896, *T. A. Williams*, *2027* and *2057½;* Silver Bow Co., *Mrs. Ida Christie.*

YELLOWSTONE PARK: Pelican Creek, 1885, *Tweedy*, *584;* Upper Falls, 1871, *Hayden*, *77:* 1885, *Letterman*, *46:* Mammoth Hot Springs, 1893, *Burglehaus.*

* **Calamagrostis Macouniana** Vasey, Contr. U. S. Nat. Herb. **3**: 81 [Kearney, Bull. U. S. Dept. Agric. Div. Agrost. 11 : 31; Ill. Fl. 1 : 163]; *Deyeuxia Macouniana* Vasey, Bot. Gaz. **10**: 297.

Differs from *C. Canadensis* in the stricter habit, smaller, denser and more contracted panicle and smaller spikelets. On river banks at an altitude of 1500 m.

MONTANA: Manhattan, 1895, *Shear*, *422; Rydberg*, *2191½*.

* **Calamagrostis Scribneri** Beal, Grasses N. Am. **2**: 343 [Kearney, Bull. U. S. Dept. Agric. Div. Agrost. 11 : 31]; *Calamagrostis dubia* Scribn.; Vasey, Cont. U. S. Nat. Herb. **3**: 80; *Deyeuxia dubia* Scribn., Bot. Gaz. **11**: 70.

Differs from *C. Canadensis* in the stricter habit, the contracted narrow panicle, the longer and stouter awn, and the glaucous upper surface of the leaves. It grows in wet meadows, among bushes, on river banks, etc., to an altitude of 2500 m.

MONTANA; Spanish Basin, 1896, *Flodman*, *47:* Alhambra, 1888, *Kelsey;* Belt Mountains, 1886, *R. S. Williams:* Fort Logan, 1883, *Scribner*, *365;* 1887, *Knowlton;* Spanish Basin, 1896, *Rydberg*, *3083*, *3096* and *3100: T. A. Williams*, *2009* and *2057:* East Gallatin Swamps, 1896, *Rydberg*, *3204*.

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy*, *585* (type).

* **Calamagrostis laxiflora** Kearney, Bull. U. S. Dept. Agric. Div. Agrost. 11 : 34; *Calamagrostis neglecta gracilis* Scribner, Bot. Gaz. 11 : 175; not *C. gracilis* Seenus.

Differs from *C. hyperborea* in the open panicle, the weak stem, the almost filiform, not rigid, leaves and the less cespitose habit, and from the next in the open panicle and the longer callus hairs. A rare plant growing at an altitude of about 2000 m.

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 582.*

* **Calamagrostis neglecta** (Ehrh.) Gaertn. Fl. Wettenau 1: 94; *Arundo neglecta* Ehrh. Beitr. 6: 137 [Kearney, Bull. U. S. Dept. Agric. Div. Agrost. 11 : 34; Ill. Fl. 1: 165].

It is distinguished from *C. hyperborea* by the same characters as the preceding, except that the panicle is not open, as in *S. laxiflora.* It is rare in Montana.

MONTANA: 1883, *Scribner, 361.*

Calamagrostis hyperborea Lange, Fl. Dan. 50: *pl. 3;* Consp. Fl. Groenl. 160 [Kearney, Bull. U. S. Dept. Agric. Div. Agrost. 11 : 39]; *Calamagrostis robusta* Vasey, Cont. U. S. Nat. Herb. 3: 82; not Muhl.; *Deyeuxia stricta* Thurber. Bot. Cal. 2: 281 [Man. R. M. 414 in part].

It is a very variable species with stiff culm and leaves and of more or less cespitose habit. It grows along rivers, in sloughs, etc. It belongs really rather to the river bottoms of the Great Plains, but extends in the valleys of the mountain regions to an altitude of 2000 m. Mr. Kearney, in the bulletin referred to above, distinguished the following varieties; for the limitations of these varieties that work may be consulted.

MONTANA: Deep Creek, 1883, *Scribner, 359;* Fort Logan, *365a;* 1886, *Tweedy, 1020;* Townsend, 1895, *Sheer, 393, 398* and *406; Rydberg, 2154.*

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 583;* 1888, *Knowlton.*

* **Calamagrostis hyperborea stenodes** Kearney, Bull. U. S. Dept. Agric. Div. Agrost. 11 : 39.

MONTANA: Lima, 1895, *Rydberg, 2318* and *2319;* East Gallatin Swamps, 1896, *Rydberg, 3169; Flodman, 53;* 1889, *F. W. Anderson.*

* **Calamagrostis hyperborea elongata** Kearney, [Bull. U. S. Dept. Agric. Div. Agrost. 11 : 40; *Deyeuxia neglecta robusta* Vasey; Macoun, Cat. Can. Pl. 4 : 206.

MONTANA: Tenderfoot Creek, 1890, *R. S. Williams, 846;* Box Elder Creek, 1887, *597;* Manhattan, 1895, *Shear, 421; Rydberg, 2191;* Madison River, *Shear, 522;* Logan, *503;* Castle, 1896, *Rydberg, 3254;* East Gallatin Swamps, *3179, 3181; Flodman, 44;* Sheep Creek, *Rydberg, 3309: Flodman, 45;* Spanish Basin, 1896, *T. A. Williams, 2072.*

* **Calamagrostis hyperborea Americana** (Vasey) Kearney, Bull. U. S. Dept. Agric. Div. Agrost. 11 : 41; *Deyeuxia neglecta Americana* Vasey; Macoun, Cat. Can. Pl. 4 : 206.

MONTANA: Rock Creek, 1883, *Scribner, 360;* Belt Mts., *360;* Bozeman, 1886, *Tweedy, 1020;* Lima, 1895, *Rydberg, 2319.*

Calamovilfa longifolia (Hook.) Hack. True Grasses, 113 [Ill. Fl. 1 : 167]; *Calamagrostis longifolia* Hook. Fl. Bor. Am. 2 : 141; *Ammophila longifolia* Benth. [Man. R. M. 413].

In sandy places up to an altitude of 1500 m. This is a grass typical of the sandy portion of the Great Plains.

MONTANA: Townsend, 1895, *Shear, 394;* Madison County, 1886, *Tweedy, 1004;* Old Blackfoot Agency, 1883, *Canby, 363:* Banks of Missouri, 1883, *Scribner, 366:* Bull Mountain, 1882, *Canby.*

* **Deschampsia brachyphylla** Nash: *Deschampsia brevifolia* R. Br. in App. Parry's Voy. 291, 1821; not *Aira brevifolia* Bieb. Fl. Taur. Cauc. 3 : 63. 1819.

Aira brevifolia Bieb. is also a *Deschampsia* and has been known as *Deschampsia caespitosa brevifolia.* It is however not the plant known under that name in this country, which is the same as *D. brevifolia* R. Br. As there is an older *Aira brevifolia* Pursh (1814), Bieberstein's plant is to be known as *D. Biebersteiniana* R. & S. *D. brachyphylla* differs from *D. caespitosa* in being much smaller and with a small dense panicle. It is an alpine plant, growing at an altitude of 3000 m.

MONTANA: Long Baldy, Little Elk Mts., 1896, *Rydberg, 3402;* West Gallatin, 1883, *Scribner, 367a.*

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 3591* and *3592* (the latter with almost white spikelets).

Deschampsia caespitosa (L.) Beauv. Agrost. 160 [Man. R. M. 414: Ill. Fl. **1**: 169]; *Aira caespitosa* L. Sp. Pl. 64 [Bot. Cal. **2**: 297].

Along streams and in wet meadows up to an altitude of 3000 m.

MONTANA: Sheep Creek, Aug. 8, 1896, *Flodman, 81;* Spanish Basin, 1896, *Flodman, 82: Rydberg, 3039;* Neihart, 1888, *R. S. Williams, 612:* Bozeman, 1886, *Tweedy, 1018:* 1883, *Scribner, 367;* Spanish Basin, 1896, *Rydberg, 3063;* Castle, *3247;* Sheep Creek, *3310:* Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 3588.*

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 616:* Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 3590:* East De Lacy's Creek, Aug. 10, *3589:* Little Belt Mts., 1883, *Scribner, 367.*

* **Deschampsia elongata** (Hook.) Munro: Benth. Pl. Hartw. 342: *Aira elongata* Hook. Fl. Bor. Am. **2**: 243 [Bot. Cal. **2**: 297].

It is characterized by its elongated narrow panicle and small spikelets. In open moist woods at an altitude of 1800–2500 m.

MONTANA: Below Baldy, near Bozeman, 1895, *Shear, 473* and *482; Rydberg, 2246:* Belt River Park, 1889: *R. S. Williams, 836;* Helena, 1892, *Kelsey:* Belt Creek, 1883, *Scribner, 368.*

* **Deschampsia atropurpurea** (Wahl.) Scheele, Flora, **27**: 56 [Ill. Fl. **1**: 170]; *Aira atropurpurea* Wahl. Fl. Lapp. 37.

It is characterized by its short broad leaves, small panicle, large dark spikelets and empty glumes, which are much longer than the flowering glume. It is a rare plant in Montana.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 957:* Park Co., 1887, *Tweedy;* Mt. Blackmore, 1886, *1017.*

Graphephorum Wolfii Vasey, Descr. Cat. Grasses U. S. 55 [Man. R. M. 423]; *Trisetum Wolfii* Vasey, Bot. Wheeler Exp. **6**: 294.

In wet meadows at an altitude of 1000–2500 m.

MONTANA: Mystic Lake, 1895, *Shear, 493: Rydberg, 2253:* Lima, *Shear, 560:* Little Belt Mts., near the pass, 1896, *Flodman, 167;* Yogo Baldy, *166;* Gallatin Co., 1886, *Tweedy, 1008.* Belt Range, 1883, *Scribner, 370;* Sun River, 1887, *R. S. Williams, 573;* Spanish Basin, 1896, *Rydberg, 3080, 3128:* Castle, *3244;* Little Belt Mts., *3328;* Yogo, *3428;* Forks of the Madison, 1897, *Rydberg & Bessey, 3671.*

YELLOWSTONE PARK: 1884, *Tweedy*, *249* and *250;* East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey*, *3669*.

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey*, *3670*.

Trisetum subspicatum (L.) Beauv. Agrost. 88 [Man. R. M. 415; Ill. Fl. 1: 171; Bot. Cal. 2: 296]; *Aira subspicata* L. Syst. Veg. Ed. 10, 673.

On hillsides up to an altitude of 2500 m.

MONTANA: Mystic Lake, 1895, *Shear*, *483* and *495: Rydberg*, *2243* and *2258;* Spanish Basin, 1896, *Flodman*, *86* and *87;* Philipsburg, 1892, *Kelsey;* Spanish Basin, 1896, *Rydberg*, *3149;* Belt Pass, *3335*.

YELLOWSTONE PARK: 1884, *Tweedy*, *261;* East Fork, 1885, *619;* Stinking Water, 1873, *Parry*, *291;* East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey*, *3596;* Shoshone Lake, *3597;* Upper Falls, Aug. 14, *3598;* 1871, *Hayden*.

Trisetum subspicatum molle (Michx.) Gray, Man. Ed. 2, 572 [Man. R. M. 415; Bot. Cal. 2: 296]; *Avena mollis* Michx. Fl. Bor. Am. 1: 72.

Range as in the species, but in dryer soil. The spike is nearly always much shorter and thicker than in the typical form.

MONTANA: Spanish Basin, 1896, *Flodman*, *88;* Long Baldy, Little Belt Mts., *89:* Bridger Mts., *90;* Yogo, 1888, *R. S. Williams*, *548;* Spanish Basin, 1886, *Rydberg*, *3103*, *3150*, *3184;* Bridger Pass, *3216;* Elk Mountains, *3279;* Long Baldy, Little Belt Mts., *3389;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey*, *3593;* McDonald's Peak, 1883, *Canby*, *366;* Little Belt Mts., 1883, *Scribner*, *369*.

YELLOWSTONE PARK: Mirror Lake, 1885, *Tweedy*, *618;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey*, *3594*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *3595*.

* **Avena Americana** Scribn., Bull. U. S. Dept. Agric. Div. Agrost. 7: 183; *Avena versicolor* Hook. Fl. Bor. Am. 2: 244; not Willd.; *A. pratensis Americana* Scribn. Coult. Bot. Gaz. 11: 177; *A. Hookeri* Scribner, Hack. True Grasses, 123.

MONTANA: Spanish Basin, July 18, 1896, *Flodman*, *79;* Belt Cañon, 1887, *R. S. Williams*, *581;* Gallatin Co., 1886, *Tweedy*, *1013;* 1883, *Scribner*, *372;* Spanish Basin, 1896, *Rydberg*, *3141;* Judith River, *3431:* Spanish Basin, June 26–July 1, 1897, *Rydberg & Bessey*, *3599* and *3600;* Fort Logan, 1883, *Scribner*, *372*.

Avena striata Michx. Fl. Bor. Am. **1**: 73 [Man. R. M. 415; Ill. Fl. **1**: 172].

In wooded river bottoms at an altitude of 1500–2000 m.

Montana: Little Belt Mts. near Barker, 1896, *Flodman, 80; Rydberg, 3363;* Belt Creek, 1883, *Scribner, 371.*

Yellowstone Park: Slough Creek and Soda Butte, 1885, *Tweedy, 612.*

Danthonia intermedia Vasey, Bull. Torr. Bot. Club, **10**: 52: *Danthonia sericea* Thurb. Bot. Cal. **2**: 294 [Man. R. M. 416]: not Nutt.

It is distinguished from *D. sericea* by its shorter and smaller culm and leaves, closer panicle, shorter awn and the flowering glume glabrous on the back.

On dry hills at an altitude of 2000–2500 m.

Montana: Mystic Lake, 1895, *Rydberg, 2244;* Spanish Basin, 1896, *Flodman, 96* and *97;* Belt Cañon, 1887, *R. S. Williams, 613;* Spanish Basin, 1896, *Rydberg, 3050, 3085;* Elk Mountain, *3293;* 1883, *Scribner, 375.*

Yellowstone Park: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3602* and *3603;* 1884, *Tweedy, 269.*

Danthonia Californica Boland. Proc. Cal. Acad. **2**: 182 [Man. R. M. 415; Bot. Cal. **2**: 294].

In meadows at an altitude of 1000–2000 m.

Montana: Bozeman, 1895, *Shear, 477* and *487;* Castle, 1896, *Flodman, 95;* Bozeman, *92;* Great Falls, 1891, *R. S. Williams, 580;* Gallatin Co., 1886, *Tweedy, 1026;* Sixteen Mile Creek, 1883, *Scribner, 373;* Bozeman, 1896, *Rydberg, 3005;* Spanish Basin, *3124;* Castle, *3236* and *3250;* Grasshopper Valley, 1880, *Watson;* Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 3605;* Blackfoot River, 1883, *Canby, 367.*

Danthonia unispicata Munro, as synonym under *Danthonia Californica unispicata* Thurb. Bot. Cal. **2**: 294 [Man. R. M. 415].

In meadows, especially in sandy soil, at an altitude of 1500–2500 m.

Montana: Bridger Mountains, 1896, *Flodman, 98;* Belt River, 1888, *R. S. Williams, 614;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 3601;* Spanish Basin, July 28, *3604;* 1883, *Scribner, 374.*

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy*, *596* and *597*; 1884, *269*.

Spartina cynosuroides (L.) Willd. Enum. 80 [Man. R. M. 405; Ill. Fl. **1**: 175; Bot. Cal. **2**: 290]; *Dactylis cynosuroides* L. Sp. Pl. 71.

Along edges of ponds and streams and in swamp lands of the Great Plains, extending in the valleys to an altitude of 1600 m.

MONTANA: Logan, 1895, *Shear*, *523*; *Rydberg*, *2283*; East Gallatin Swamps, 1896, *Flodman*, *101*: Helena, 1891, *Kelsey*; Townsend, 1883, *Scribner*, *330*; East Gallatin Swamps, 1896, *Rydberg*, *3200*.

Spartina gracilis Trin. Mem. Acad. St. Petersb. (VI.) **6**: 110 [Man. R. M. 405; Ill. Fl. **1**: 176; Bot. Cal. **2**: 290].

In wet meadows, especially in saline soils, up to an altitude of 1600 m. It is a species belonging to the Great Plains rather than the mountain region.

MONTANA: Manhattan, 1895, *Shear*, *446*; *Rydberg*, *2204*; Townsend, *Shear*, *392*; *Rydberg*, *2152*; Dillon, *Shear*, *335*; *Rydberg*, *2080*; East Gallatin Swamps, 1896, *Flodman*, *102*; Great Falls, 1886, *R. S. Williams*, *558*; Teton River, 1883, *Scribner*, *329*; Crow Creek Valley, *329*; East Gallatin Swamps, 1896, *Rydberg*, *3194*.

YELLOWSTONE PARK: Upper and Lower Geyser Basin, *Coulter*; Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey*, *3606*.

Beckmannia erucaeformis (L.) Host, Gram. Austr. **3**: 5 [Man. R. M. 403; Ill. Fl. **1**: 181; Bot. Cal. **2**: 264]; *Phalaris erucaeformis* L. Sp. Pl. 55.

A good hay-grass, growing in low ground and ascending to an altitude of 2000 m.

MONTANA: Townsend, *Shear*, *389*; *Rydberg*, *2169*; Red Rock, *Shear*, *327*; Deer Lodge, *Rydberg*, *2134*; East Gallatin Swamps, 1896, *Flodman*, *99*; Centerville, 1883, *Scribner*, *327*; Bozeman, 1884, *Tweedy*, *280*; Madison Valley, 1871, *Hayden*; East Gallatin Swamps, 1896, *Rydberg*, *3175*; Castle, *3246*; Madison Co., *Mrs. McNulty*.

YELLOWSTONE PARK: Stinking Water, 1873, *C. C. Parry*, *296*.

Bouteloua oligostachya (Nutt.) Torr.; A. Gray, Man. Ed. 2, 553 [Man. R. M. 416; Ill. Fl. **1**: 180; Bot. Cal. **2**: 291]; *Atheropogon oligostachyus* Nutt. Gen. **1**: 78.

One of the most valuable forage plants of the Great Plains, extending into the valleys and reaching an altitude of 2000 m.

MONTANA: Melrose, *Shear, 351; Rydberg, 2104* and *2290;* Manhattan, *Shear, 409; Rydberg, 2179;* Judith River, 1896, *Flodman, 100:* Custer Co., 1892, *Mrs. Light;* Helena, 1892, *Kelsey:* Great Falls, 1890, *R. S. Williams, 305;* Madison Co., 1886, *Tweedy, 1005;* 1883, *Scribner, 377;* Judith River, 1896, *Rydberg, 3429;* Silver Bow Co., *Mrs. B. S. Miles;* Judith Gap, 1882, *Canby LVI;* Horned Creek, 1883, *Scribner, 377;* Fish Creek, 1871, *Hayden;* Billings, 1898, *Williams & Griffith.*

Schedonnardus paniculatus (Nutt.) Trelease; Branner & Coville, Rep. Geol. Surv. Ark. 1888, part 4, 236 [Ill. Fl. **1**: 179]; *Lepturus paniculatus* Nutt. Gen. **1**: 81 [Bot. Cal. **2**: 322]: *Schedonnardus Texanus* Steud. Syn. Pl. Gram. 146 [Man. R. M. 416].

In sandy soil, especially on river banks, in the prairie and plain regions, extending into the valleys and reaching an altitude of 1600 m.

MONTANA: Great Falls, 1890, *R. S. Williams, 821:* Teton River and Plains of Missouri, 1882, *Scribner, 376;* Bozeman, 1887, *Tweedy;* Miles City, 1881, *Canby.*

Munroa squarrosa (Nutt.) Torr. Pac. R. R. Rep. **4**: 158 [Man. R. M. 418; Ill. Fl. **1**: 183]; *Crypsis squarrosa* Nutt. Gen. **1**: 49.

In dry soil, especially where the ground has been disturbed, as on railroad banks, "prairie-dog towns," etc., up to an altitude of 1500 m.

MONTANA: Logan, 1895, *Shear, 515; Rydberg, 2265:* Helena, 1891, *Kelsey;* Hell-gate Cañon, 1880, *Watson:* Indian Creek, 1883, *Scribner, 379;* Silver Bow Co., 1888, *Tweedy, 128.*

Phragmites Phragmites (L.) Karst. Deutschl. Fl. 379 [Ill. Fl. **1**: 184]; *Arundo Phragmites* L. Sp. Pl. 81: *Phragmites communis* Trin. Fund. Agrost. 134 [Man. R. M. 418; Bot. Cal. **2**: 300].

In water, ascending in the valleys to an altitude of 2000 m.

MONTANA: Logan, 1895, *Shear, 525;* Great Fall, *F. W. Anderson;* Silver Bow Co., *Mrs. Jennie Moore;* Missouri River, 1883, *Scribner, 378* and *379* in part.

Eragrostis major Host, Gram. Austr. **4**: 14 [Ill. Fl. **1**: 189]; *Eragrostis poacoides* var. *megastachya* Gray, Man. Ed. 5, 631 [Man. R. M. 419; Bot. Cal. **2**: 315].

Resembling somewhat *E. Purshii* but spikelets larger, over 2 mm. wide. An ill-scented species naturalized from Europe, but rather rare in Montana.

MONTANA: Great Falls, 1891, *R. S. Williams, 845;* Prickly Pear Cañon, 1883, *Scribner, 384;* Yellowstone near Huntley, 1882, *Canby.*

* **Melica subulata** (Griseb.) Scribn. Proc. Phila. Acad. **1885**: 47; *Bromus subulatus* Griseb. Fl. Ross. **4**: 358; *Melica acuminata* Bolander, Proc. Calif. Acad. **4**: 104 [Bot. Cal. **2**: 305].

It is distinguished from the other two species by its acute spikelets. In cañons at an altitude of 2000–2500 m.

MONTANA: Mystic Lake, 1895, *Shear, 491: Rydberg, 2246* and *2250:* below Baldy, Bridger Mountains, *2232;* Neihart, 1888, *R. S. Williams, 583;* Spanish Basin, 1896, *Flodman, 111.*

Melica spectabilis Scribn. Proc. Phila. Acad. **1885**: 45 [Man. R. M. 420].

On rich hillsides and in meadows at an attitude of 1500–2500 m.

MONTANA: Mystic Lake, 1895, *Shear, 496; Rydberg, 2248;* Yogo Baldy, Little Belt Mts., 1896, *Flodman, 112:* Spanish Basin, *114;* Bridger Mts., July 28, *116:* Spanish Basin, *Rydberg, 3018, 3036* and *3052;* Bozeman, *3010:* Bridger Mts., *3212:* Elk Mountains, *3285:* Yogo Baldy, *3419:* Crow Creek Mts., 1883, *Scribner, 385;* Bridger Mts., June 14–18, 1897, *Rydberg & Bessey, 3609* and *3610.*

YELLOWSTONE PARK: 1884, *Tweedy, 268;* Soda Butte, 1885, *601;* East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3611.*

Melica bulbosa Geyer; Hook. Kew Journ. Bot. **8**: 19 [Man. R. M. 420].

On rich hillsides at an altitude of 1800–2500 m.

MONTANA: Baldy, Bridger Mountains, 1895, *Shear, 470:* Lima, *557;* Belt Cañon, 1888, *R. S. Williams, 817;* Hell Roaring Creek, 1886, *Tweedy, 1025;* Belt Mountains, 1883, *Scribner, 386.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 295.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 3612.*

Melica Californica Scribn. Proc. Phila. Acad. **1885**: 45 [Man. R. M. 420].

It is a rare plant within the region. Only one specimen has been seen by me.

YELLOWSTONE PARK: Mud Springs, 1871, *Hayden*.

Catabrosa aquatica (L.) Beauv. Agrost. 157 [Man. R. M. 419: Ill. Fl. **1**: 194]; *Aira aquatica* L. Sp. Pl. 64.

An aquatic grass of no economic value, growing in streams at an altitude of 1500–2500 m.

MONTANA: Bozeman, 1885, *Tweedy, 577:* 1895, *Shear, 462:* Townsend, *401:* Black Hawk, 1896, *Flodman, 110:* Sheep Creek, 1896, *Rydberg, 3306:* Elk Mountains, *3287:* Gallatin City, 1883; *Scribner, 383;* Bozeman, 1887, *Tweedy:* Jack Creek, July 16, 1897, *Rydberg & Bessey, 3608.*

YELLOWSTONE PARK: Gardiner River, 1885, *Tweedy, 577.*

Koeleria cristata (L.) Pers. Syn. **1**: 97 [Man. R. M. 418: Ill. Fl. **1**: 194: Bot Cal. **2**: 301]: *Aira cristata* L. Sp. Pl. 63.

One of the most valuable pasture grasses of the Great Plains and the open foothills of the mountain region, attaining an altitude of 2500 m.

MONTANA: Lima, 1895, *Shear, 318: Rydberg, 2069:* Manhattan, *Shear, 412;* Dear Lodge, *373;* Silver Bow, *Rydberg, 2111;* Spanish Peaks, 1896, *Flodman, 104* and *105;* East Gallatin Swamps, *106;* Great Falls, 1887, *R. S. Williams:* Spanish Basin, 1896, *Rydberg 3029, 3059, 3082, 3146:* July 28, 1897, *Rydberg & Bessey, 3607:* East Gallatin Swamps, *3190:* Elk Mts., *3262, 3291, 3294;* Yogo, *3413;* Grasshopper Valley, 1880, *Watson:* Missoula Co., *Mrs. Kennedy;* Lewis and Clarke Co., *Mrs. Muth:* Gallatin City, Smith River, 1883, *Scribner, 380:* Flathead Region, 1883, *H. B. Ayres.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 289:* 1884, *Tweedy, 260.*

Eatonia obtusata (Michx.) A. Gray, Man. Ed. 2,558 [Man. R. M. 419; Ill. Fl. **1**: 192; Bot. Cal. **2**: 302]; *Aira obtusata* Michx. Fl. Bor. Am. **1**: 62.

In meadows, especially among bushes, up to an altitude of 2000 m.

MONTANA: Melrose, 1895, *Shear, 540;* Manhattan, *439;* Giant Springs, 1887, *R. S. Williams, 608;* Little Belt Mts., 1896, *Ryd-*

berg, 3347; Silver Bow Co., *Mrs. Belle A. Miles;* Prickly Pear Cañon, 1883, *Scribner, 382;* Missoula, 1898, *Williams & Griffith.*

* **Eatonia obtusata robusta** Vasey; Rydb. Contr. U. S. Nat. Herb. **3**: 190.

More robust than the species, with leaves 5–6 mm. wide.

MONTANA: Townsend, 1895, *Shear, 390; Rydberg, 2150.*

* **Eatonia Pennsylvanica** (DC.) A. Gray, Man. Ed. 2, 558 [Ill. Fl. **1**: 193]; *Koeleria Pennsylvanica* DC. Cat. Hort. Monsp. 117.

Resembling the last but with the second glume oblanceolate, not obovate, truncate. In wet meadows up to an altitude of 2000 m.

MONTANA: Manhattan, 1895, *Shear, 428* and *442: Rydberg, 2174;* Logan, *Shear, 517; Rydberg, 2268;* East Gallatin Swamps, 1896, *Flodman, 103; Rydberg, 3173* and *3183;* Horned Creek, 1883, *Scribner, 381* (var. *stricta*).

* **Eatonia Pennsylvanica major** Torr.; A. Gray. Man. Ed. 2, 558.

Taller and with more compound panicle. It has the same range as the species.

MONTANA: Townsend, 1895, *Rydberg, 2160;* Bozeman, *Shear, 458;* Melrose, *538;* East Gallatin Swamps, 1896, *Rydberg, 3174;* Bozeman, 1886, *Tweedy, 1016.*

Distichlis spicata stricta (Torr.) Scribn. Mem. Torr. Bot. Club, **5**: 51; *Uniola stricta* Torr. Ann. Lyc. N. Y. **1**: 155; *D. maritima stricta* Thurber, Bot. Cal. **2**: 306 [Man. R. M. 420].

In saline soil, throughout the plains and prairies, ascending in the valleys to an altitude of 2000 m.

MONTANA: Melrose, 1895, *Shear, 344;* Belt River, 1896, *R. S. Williams, 554;* Musselshell River, 1896, *Rydberg, 3434;* Gallatin City, 1883, *Scribner, 387;* Flathead Region, 1883, *H. B. Ayres;* Billings, 1896, *Williams & Griffith.*

Poa compressa L. Sp. Pl. 69 [Man. R. M. 421: Ill. Fl. **1**: 202].

In woods and thickets at an altitude of about 2000 m.

MONTANA: Deer Lodge, 1895, *Rydberg, 2132½;* Helena, July 13, *2143; Shear, 382* and *399.*

Poa alpina L. Sp. Pl. 67 [Man. R. M. 421; Ill. Fl. **1**: 203; Bot. Cal. **2**: 312].

Most common in damp places on alpine peaks, among rocks or along brooks at an altitude of 2500–3300 m.: but sometimes found at an altitude of 2000 m. along the cold mountain streams.

MONTANA: Lima, 1895, *Shear, 662: Rydberg, 2305:* Mystic Lake, *2234* and *2236:* Spanish Basin, 1896, *Flodman, 124:* Little Belt Mts., near the pass, *127:* near Barker, *126:* Yogo, 1888, *R. S. Williams, 572;* Mt. Blackmore, 1886, *Tweedy, 1024:* Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 3618, 3619* and *3626:* Spanish Basin, July 28, *3620* and *3624:* Cedar Mountain, July 16, *3623:* Mt. Chauvet, July 29, *3621, 3625* and *3654:* Spanish Basin, 1896, *Rydberg, 3022:* Bridger Cañon, *3213:* Little Belt Pass, *3319:* McDonald's Peak, 1883, *Canby, 374:* Upper Marias Pass, *375:* Little Belt Mts., 1883, *Scribner, 388.*

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy, 628;* Slough Creek, *627:* Electric Peak, August 20, 1897, *Rydberg & Bessey, 3622.*

* **Poa longipila** Nash.

Whole plant, with the exception of the flowering scales, smooth and glabrous. Culms 3–4.5 dm. tall, erect, the upper portion naked: culm with one leaf, or occasionally two leaves; sheaths commonly elongated; ligule scarious, about 4 mm. long, broad, obtuse or acutish: blades erect, strict, firm, acuminate, 3–8 cm. long, 3–4 mm. wide, slightly roughened above: panicle loose and open, 6–9 cm. long, its finally widely spreading branches naked for the greater part of their length, spikelet-bearing and dividing only at the summit, the lower branches 3–4 cm. long and often reflexed: spikelets 6–8 mm. long, ovate-lanceolate, acute, on very short pedicels: scales usually 6, sometimes 5, purple, excepting the margins, acute, the lower 2 empty, the first 1-nerved, the second 3-nerved, the flowering scales 5–6 mm. long, 5-nerved, the intermediate nerves faint, the internerves distinctly appressed-pubescent below, the hairs growing shorter and vanishing toward the apex, the lateral nerves and midnerve copiously pubescent with long hairs, the former for about one-half their length, the latter for about two-thirds, the longer hairs on the midnerve about 1.5 mm. long, the crisped hairs on the callus very copious and long, when straightened out 3–5 mm. long; palet about four-fifths as long as the scale, ciliate on its 2 nerves.

YELLOWSTONE PARK: Electric Peak, 1897, *Rydberg, 3614.*

* **Poa purpurascens** Vasey, Bot. Gaz. 6: 297.

It has the short dense spike of *P. epilis* and *P. Cusickii*, but is not a bunch grass. As in *Poa alpina*, it is characterized by its purple flowers, but the plant is much taller, the glumes larger and more acuminate. It grows at an altitude of 2500–3000 m.

MONTANA: Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 3628* and *3653*.

YELLOWSTONE PARK: Yellowstone Lake, 1885, *Tweedy, 645*.

* **Poa reflexa** Vasey & Scribner, Contr. U. S. Nat. Herb. **1**: 276.

It is nearest related to *Poa arctica*, but distinguished by the longer reflexed branches and smaller spikelets. It is common along brooks at an altitude of 2000–3000 m. *Poa acuminata* Scribner is only a larger flowered form of this species.

MONTANA: Bridger Mts., 1896, *Flodman, 119* and *120;* Elk Mts., near Black Hawk; Long Baldy, Little Elk Mts., *122* and *123;* Park Co., 1887, *F. Tweedy:* Mt. Blackmore, 1886, *1027;* East Gallatin, 1886, *1028:* Belt Mts., 1882, *Scribner, 392:* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 3616* and *3630:* Bridger Cañon, 1896, *Rydberg, 3215* and *3218;* Elk Mts., *3290;* Little Belt Mts., *3337* and *3391*.

YELLOWSTONE PARK: 1885, *Tweedy, 638* and *639:* Electric Peak, Aug. 28, 1897, *Rydberg & Bessey, 3615:* East De Lacy's Creek, Aug. 10: Yellowstone Lake, 1871, *Hayden*.

A very depauperate form of this or a nearly related species was collected in the Yellowstone Park, 1884, by Tweedy, *274*.

* **Poa Grayana** Vasey, Cont. U. S. Nat. Herb. **1**: 272.

It is a stoloniferous plant, 3–4 cm. high, with a narrow drooping panicle, and characterized by its lanceolate, acute floral glumes. It is an alpine plant growing at an altitude of over 3000 m.

MONTANA: McDonald's Peak, 1883, *Canby, 376*.

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 634*.

(This was determined by Prof. Scribner as *P. Pattersonii*, to which it scarcely belongs, however, judging from the specimens of that species in the Columbia Herbarium.)

Poa Eatoni Watson, Bot. King's Exp. **5**: 386 [Man. R. M. 422].

In rich soil in the mountain regions, rare.

MONTANA: 1883, *Scribner, 400*.

Poa alpicola Nash; *Poa laxa* Thurb. Bot. Cal. **2**: 312 [Man. R. M. 421]; not Haenke.

On the highest mountain peaks at an altitude of over 3000 m.

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 3613*.

* **Poa Wheeleri** Vasey: Rothrock, U. S. Geol. Surv. **6**: 291.

It resembles in habit somewhat *P. pratensis* or still more the eastern *P. brevifolia* Muhl.: but the flowers are acute and not webbed at the base. In meadows at an altitude of 2000–2500 m.

MONTANA: Bozeman Cañon, 1895, *Shear*, *478* and *490:* Spanish Basin, 1896, *Flodman*, *160* and *163:* Little Belt Mts., *162* and *164:* Elk Mts., *161:* Indian Creek, July 22, 1897, *Rydberg & Bessey*, *3627:* Spanish Basin, 1896, *Rydberg*, *3015*, *3019*, *3020*, *3021½*, *3026*, *3031* : Bozeman, *3009:* Elk Mts., *3295:* Little Belt Mts., *3326* and *3379:* Gallatin County, 1886, *Tweedy*, *1029*.

YELLOWSTONE PARK: East DeLacy's Creek, August 10, 1897, *Rydberg & Bessey*, *3637* and *3642;* Electric Peak, August 18, *3644*.

* **Poa Vaseyana** Scribn.; Beal, Grasses of N. A. **2**: 532.

Scarcely distinct from *P. Wheeleri*, differing only in the larger spikelets and the longer glumes. It grows in locations similar to the preceding.

MONTANA: Little Belt Mts., 1896, *Flodman*, *157:* Spanish Basin, *159:* June 28, 1897, *Rydberg & Bessey*, *3633*, *3638* and *3639:* 1896, *Rydberg*, *3134:* Little Belt Pass, *3334:* Yogo Baldy, *3423*.

YELLOWSTONE PARK: 1884, *Tweedy*, *276*.

Poa pratensis L. Sp. Pl. 67 [Man. R. M. 422: Ill. Fl. **1**: 204; Bot. Cal. **2**: 312].

Common in meadows up to an altitude of 2000 m. It is one of the most valuable forage plants.

MONTANA: Red Rock, 1895, *Shear*, *329:* *Rydberg*, *2092:* Melrose, *2101* and *2102:* *Shear*, *560:* Deer Lodge, *376:* *Rydberg*, *2133;* Townsend, *2167:* *Shear*, *400:* Manhattan, *Rydberg*, *2181:* Bozeman, *2215* and *2217;* Bozeman Cañon, *Shear*, *489;* Mystic Lake, *484:* Melrose, *Rydberg*, *2295:* Lima, *2310:* Little Belt Mts., 1896, *Flodman*, *152* and *155:* Spanish Basin, *153* and *154:* Alhambra, 1890, *Kelsey:* Great Falls, 1890, *R. S. Williams*, *574:* Spanish Basin, 1896, *Rydberg*, *3021*, *3060*, *3062:* Elk Mts., *3286:* Sheep Creek, *3300*, *3302*, *3303;* Little Belt Mts., *3315*, *3326½* and *3344;* Yogo, *3407;* Jack Creek, July 12, 1897, *Rydberg & Bessey*, *3641;* Flathead Region, 1883, *H. B. Ayres*.

YELLOWSTONE PARK: 1884, *Tweedy*, *254*.

A form with strict tall stem, broad leaves and large often more acutish flowers is found along streams. To this the following specimens are referred:

MONTANA: Castle, 1896, *Rydberg, 3240;* Elk Mts., *3273*; Sheep Creek, *3312;* Crown Creek, 1883, *Scribner, 393.*

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3635* and *3667;* Yellowstone Lake, Aug. 12, *3643;* 1884, *Tweedy, 277* and *304;* Mammoth Hot Springs, 1885, *646.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 3660.*

Poa flava L. Sp. Pl. 68 [Ill. Fl. **1**: 205]; *Poa serotina* Ehrh. Beitr. **6**: 83 [Man. R. M. 422; Bot. Cal. **2**: 313].

In meadows and wet woodlands to an altitude of 1500 m.

MONTANA: Helena, near Broadwater Hot Springs, 1895, *Rydberg, 2144* and *2145;* Townsend, July 15, *2162;* Manhattan, *2190; Shear, 427½;* Bozeman Cañon, *499;* Logan, *513; Rydberg, 2267;* Gallatin, July 29, *2289; Shear, 532;* Helena, 1883, *Canby, 370.*

Poa nemoralis L. Sp. Pl. 69 [Ill. Fl. **1**: 205]; *Poa caesia strictior* A. Gray, Man. Ed. 5, 629 [Man. R. M. 421].

Common in wet places, especially along the borders of woods, up to an altitude of 2000 m.

MONTANA: Melrose, 1895, *Rydberg, 2100;* Manhattan, *2175* and *2192;* Baldy, Bridger Mts., *2229; Shear, 463, 469;* Lima, *Rydberg, 2309; Shear, 564* and *556;* Spanish Basin, 1896, *Flodman, 133;* Spanish Peaks, *136;* Elk Mts., near Black Hawk, *134;* Little Belt Mts., near the pass, *141;* near Barker, *143;* Helena, 1889 and 1892, *Kelsey;* Yogo, 1888, *R. S. Williams, 563;* 1883, *Scribner;* Bozeman, 1887, *Tweedy;* Jack Creek, July 14, 1897, *Rydberg & Bessey, 3640;* Spanish Basin, 1896, *Rydberg, 3078, 3087, 3097, 3098, 3101;* Bridger Cañon, *3210;* Elk Mts., *3248, 3263, 3270;* Sheep Creek, *3301, 3317;* Little Belt Mts., *3319½, 3350, 3367, 3372, 3376* and *3380;* Sixteen Mile Creek, 1883, *Scribner, 394a;* Belt Mts., *394;* Flathead River, 1883, *Canby, 369;* Nevada Creek, 1883, *Canby,* 371 (tall specimens with unusually large spikelets).

YELLOWSTONE PARK: 1884, *Tweedy, 275;* Lone Creek, 1885, *640* and *647;* Upper Falls, Aug. 14, 1897, *Rydberg & Bessey, 3634a.*

* **Poa rupicola** Nash; *Poa rupestris* Vasey, Bull. Torr. Bot. Club, **14**: 94; not Bieb. nor Roth.

A small alpine species resembling somewhat *P. nemoralis*, but with a low strict stem and a narrow panicle. It grows at an altitude of about 3000 m.

MONTANA: Old Hollowtop, Pony, July 9, 1897, *Rydberg & Bessey, 3646* (depauperate form); Mt. Chauvet, July 29, *3657*; 1883, *Scribner, 389*: Upper Marias Pass, 1883, *Canby, 372*; Little Belt Mts., 1883, *Scribner, 389*.

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3645*: Electric Peak, Aug. 18, *3652*.

* **Poa nervosa** (Hook.) Vasey, Ill. N. A. Gr. **2**: part 2, 81; *Festuca nervosa* Hook. Fl. Bor. Am. **2**: 251.

It is distinguished by its broad, flat culm leaves, flattish, 3–8-flowered spikelets, and the rather distant and prominently 5-nerved floral glumes. It is a rare plant, growing at an altitude of 1000–2000 m.

MONTANA: Jefferson City, 1883, *Scribner, 395* in part; McDonald's Peak, 1883, *Canby, 379*: Bozeman Pass, *378*.

YELLOWSTONE PARK: 1885, *Letterman, 67*.

Poa occidentalis (Vasey); *Poa flexuosa occidentalis* Vasey; Rothrock, Rep. U. S. Geol. Surv. **6**: 290. 1878 [Man. R. M., 422]; not *P. occidentalis* Vasey. 1893.

A rare plant growing in rich, moist soil at an altitude of about 2000 m.

MONTANA: Helena, 1888, *Kelsey*.

* **Poa laevigata** Scribn. Bull. U. S. Dept. Agric. Div. Agrost. 5: 31; *Poa laevis* Vasey, Cont. U. S. Nat. Herb. **1**: 273; not R. Br.

Nearly related to *P. Buckleyana*, but the whole plant pale and shining; basal sheaths rather rigid; leaves short and rigid, strongly revolute. Hillsides, benchlands and dry valleys at an altitude of 2000–3000 m.

MONTANA: Red Rock, 1895, *Shear, 325*: Melrose, July 6, *343* and *348*; *Rydberg, 2096* and *2097*; Deer Lodge, *2129*: *Shear, 363* and *374*; Lima, *Rydberg, 2320*: 1883, *Scribner, 396*: Cliff Lake July 27, 1897, *Rydberg & Bessey, 3636*.

YELLOWSTONE PARK: Yellowstone Lake, 1885, *Tweedy, 643*.

* **Poa lucida** Vasey, Cont. U. S. Nat. Herb. **1**: 274.

Very nearly related to the preceding and scarcely distinct. It is characterized by the unequal empty glumes, and the membranous decurrent ligules which are about 4 mm. long. It grows on hillsides and dry valleys, at an altitude of 2000–3000 m.

MONTANA: Lima, 1895, *Shear, 562*: *Rydberg, 2312*: Elk Mts., near Black Hawk, 1896, *Flodman*, *132;* Helena, 1889, *Kelsey;* Spanish Basin, 1896, *Rydberg*, *3046* and *3161;* Cottonwood Creek, *3228;* Sixteen Mile Creek, 1883, *Scribner*, *391*.

Poa Buckleyana Nash, Bull. Torr. Bot. Club, **22**: 465 [Ill. Fl. **1**: 208]; *Poa tenuifolia* Buckley, Proc. Phila. Acad., **1862**: 96 [Man. R. M. 421]; not A. Rich. 1851.

In dryer meadows and on benchlands and prairies to an altitude of 2000 m.

Montana: Bozeman, 1895, *Shear*, *467;* Mystic Lake, *Rydberg*, *2260;* Lima, *2321;* Little Belt Mts., near the pass, *Flodman*, *127* and *129;* Spanish Basin, June 28, 1897, *Rydberg & Bessey*, *3661;* Spanish Basin, 1896, *Rydberg*, *3025* and *3147;* Bridger Cañon, *3224* and *3225;* Yogo Baldy, *3417*, *3421* and *3427;* Sweet Grass Cañon, *3443*.

Yellowstone Park: East Fork, 1885, *Tweedy*, *637;* Soda Butte, 1885, *632;* Electric Peak, Aug., 1897, *Rydberg & Bessey*, *3663* (?): East DeLacy's Creek, Aug. 10, *3662;* Yellowstone Lake, 1885, *Tweedy*, *641*.

Idaho: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *3655*, *3656*, *3658*, *3659* (the last with narrow leaves).

* **Poa Nevadensis** Vasey, Bull. Torr. Bot. Club, **10**: 66.

Like *P. Buckleyana* but stouter and scabrous; leaves broader and panicle larger. An excellent haygrass, growing in meadows and on hillsides at an altitude of 2000–3000 m.

Montana: Red Rock, 1895, *Rydberg*, *2091;* Mystic Lake, *2259;* Melrose, *2293;* *Shear*, *541;* Lima, *552* and *567;* *Rydberg*, *2313;* Spanish Peaks, 1896, *Flodman*, *146;* Spanish Basin, *147* and *149;* Elk Mountains, near Castle, *151;* Jack Creek, July 16, 1897, *Rydberg & Bessey*, *3665;* Spanish Basin, 1896, *Rydberg*, *3050* and *3111;* Castle, *3243* and *3249;* Black Hawk, *3263* and *3272;* 1883, *Scribner*, *397* and *398*.

Yellowstone Park: 1884, *Tweedy*, *276* and *279;* East Pelican Creek, 1885, *642;* East Fork, *645;* Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey*, *3664;* Electric Peak, Aug. 18, *3666*.

* **Poa pratericola** Rydb. & Nash; *Poa arida* Vasey, Cont. U. S. Nat. Herb. **1**: 270 [Ill. Fl. **1**: 208]; not *Poa pratensis arida* Parnell, Grasses of Britain, 74; *Poa andina* Nutt.; Wats. King Exp. **5**: 388; not Trin.

It is distinguished from *P. Fendleriana* and *P. Buckleyana* by the smaller spikelet, smaller glumes, pubescence between the nerves of the floral glumes and narrow panicle. Dry prairies, reaching an altitude of 2000 m.

YELLOWSTONE PARK: 1873, *C. C. Parry, 298.*

* **Poa Suksdorfii** Vasey; Beal, Grasses of N. A. **2**: 574, as synonym under *Atropis Suksdorfii.*

A species of the *Buckleyana* group, 10–15 cm. high, densely tufted; basal leaves rigid, conduplicate; panicle small and spike-like. The culm exceeds the basal leaves by about one-half. It grows on high mountains at an altitude of 3000 m.

MONTANA: Lima, 1895, *Shear, 312.*

Poa longiligula S. & W. Circ. U. S. Dept. Agric. Div. Agrost. 9: 3; *Poa Californica* Coult. Man. R. M. 421, in part; not Scribn.

It differs from *P. Fendleriana* (*P. Californica* Coulter, mainly) in the long and decurrent ligules, larger spikelets and denser pubescence on the flowering glumes. On exposed mountain sides at an altitude of 2000–3000 m.

MONTANA and IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 3649* and *3650.*

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy, 631;* Mammoth Hot Springs, 1885, *Tweedy, 629.*

* **Poa longepedunculata** Scribn. Bull. U. S. Dept. Agric. Div. Agrost. 11: 54; *Poa Fendleriana spicata* (Vasey) Scribn., Bull. U. S. Dept. Agric. Div. Agrost. 5: 31; *Poa andina spicata* Vasey, Bot. Wheeler Exp. 290; not *P. spicata* L.

Differs from *P. Fendleriana* in its taller habit, and interrupted panicle which is longer, narrower and greener. In meadows at an altitude of 2000 m.

MONTANA: Townsend, 1897, *Rydberg, 2158;* Silver Bow, *2112;* Manhattan, July 17, *2178.* (These specimens were determined at the United States Department of Agriculture as *P. Fendleriana spicata*, but they differ from the Colorado specimens in the larger and shining spikelets. It may be a distinct species.)

* **Poa subaristata** Scribn.; Beal, Grasses of N. A. **2**: 533.

It is characterized by the tufted habit, resembling somewhat *P. Fendleriana*, but leaves involute, panicle very short and crowded, floral glumes long (6 mm.) and narrow, acuminate, scarious-margined and not webbed at the base. It grows on the alpine peaks at an altitude of about 3000 m.

MONTANA: Lima, 1895, *Shear, 311, 315, 321, 323; Rydberg, 2075;* Anaconda, 1892, *Kelsey;* Bozeman, 1883, *Scribner, 399;* Old Hollowtop Pony, July 7, 1897, *Rydberg & Bessey, 3651:* Mt. Chauvet, July 29, *3647, 3648.*

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy, 630;* East Fork, *633.*

* **Poa Cusickii** Vasey, Cont. U. S. Nat. Herb. **1**: 271.

A species of the *P. Fendleriana* group, with short panicle and narrow revolute leaves. In form and size of the panicle it resembles *P. epilis*, but it is a true bunchgrass, growing on dry hills at an altitude of 2000–3000 m.

MONTANA: Gallatin Peak, 1886, *Tweedy, 1031* (?); Lone Mountain, *1030* (?); Gallatin Co., *1032* (?); Upper Marias Pass, 1883, *Canby, 373* in part and *377.*

IDAHO: Beaver Cañon, June 27, 1895, *Shear, 309; Rydberg, 2055.*

* **Poa epilis** Scribn. Circ. U. S. Dept. Agric. Div. Agrost. **9**: 5.

A cespitose grass with the short panicle of *P. Cusickii* and *P. subaristata*, but more open and more or less nodding; spikelets compressed; empty glumes smooth, unequal; flowering glumes rough-hispid on the back, especially on the keel and marginal nerves. It grows on mountain sides at an altitude of 2000–3000 m.

MONTANA: Bridger Mountains, 1896, *Rydberg, 3223; Flodman, 131;* Gallatin Co., 1886, *Tweedy, 1032;* Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 3629.*

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy, 636.*

Panicularia nervata (Willd.) Kuntze, Rev. Gen. Pl. 783 [Ill. Fl. **1**: 212]; *Poa nervata* Willd. Sp. Pl. **1**: 389: *Glyceria nervata* Trin. Mem. Acad. St. Petersb. (VI.) **1**: 365 [Man. R. M. 423; Bot. Cal. **2**: 307].

In wet meadows, on river banks, etc., up to an altitude of 2000 m.

MONTANA: Lima, 1895, *Shear, 316: Rydberg, 2068* and *2307;* Manhattan, *Shear, 418* and *426; Rydberg, 2182* and *2200;* East Gallatin Swamps, 1896, *Flodman, 170;* Spanish Basin, *171;* Elk Mts., near Castle, *175;* Alhambra, 1888, *Kelsey;* Yogo, 1888, *R. S. Williams, 593;* Centerville, 1883, *Scribner, 403;* Spanish Basin, 1896, *Rydberg, 3126, 3135* and *3157;* Yogo Gulch, *3409* (pale-flowered form) and *3410;* Jack Creek. July 15, 1897, *Rydberg & Bessey*, *3673;* Spanish Basin, July 11, *3672.*

* **Panicularia nervata rigida** Nash.

Differs from the type in its lower (3–5 dm. tall) and more rigid culms, its shorter erect firm leaves, and its more constricted smaller panicle with shorter and almost erect branches.

Near springs at an elevation of 2000–2500 m.

MONTANA: Lima, June 29, 1895, *P. A. Rydberg*, *2068* (the type: distributed as "*Glyceria nervata stricta* Scribn.," but this name is invalidated by the earlier *Glyceria stricta* Hook.).

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy*, *594*.

* **Panicularia elata** Nash.

Culms 1–1.5 m. tall, smooth and glabrous; leaves 5–7; sheaths very rough, nearly equalling to exceding the internodes, loosely embracing the culm: ligule scarious, 2 mm. long, truncate at the apex; blades lax, very rough on both surfaces and on the margins, linear, acuminate at the apex, 2–4 dm. long, 6–10 mm. wide; panicle loose and open, its branches usually in pairs, finally widely spreading, the lower ones 1–1.5 dm. long and frequently reflexed, they and their primary divisions dividing from and above the middle; spikelets 3–4 mm. long, ovate, on pedicels usually shorter than themselves; scales 6 or 7, the lower 2 empty, much smaller than the others, hyaline, often tinged with purple, rounded at the apex, 1-nerved, the flowering scales about 2 mm. long, very broad, 7-nerved, the nerves distinct at the base but becoming less manifest above the middle and vanishing below the summit; palet a little exceeding the scale; grain oval, about 1 mm. long.

In shaded alder bogs at an altitude of 1500–2500 m.

MONTANA: Sweet Grass Cañon, Crazy Mts., Sept. 1896, *J. H. Flodman*, *176* (the type); *Rydberg*, *3441*.

IDAHO: Forest, Nez Perces Co., July 14, 1896, *A. A. & E. G. Heller*, *3424*.

YELLOWSTONE PARK: Pelican Creek, 1885, *Tweedy*, *593*.

Panicularia Americana (Torr.) MacM. Met. Minn. 81 [Ill. Fl. **1**: 212]; *Poa aquatica Americana* Torr. Fl. U. S. **1**: 108; *Glyceria grandis* S. Wats. in A. Gray, Man. Ed. 6, 667: *G. aquatica* Coulter, Man. R. M. 423.

Common in water within the plain and prairie regions, extending in the valleys to an altitude of 1500 m.

MONTANA: Garrison, 1895, *Shear, 370; Rydberg, 2124;* Townsend, *Shear, 402;* Bozeman, *454;* Logan, *509; Rydberg, 2266;* East Gallatin Swamps, 1896, *Flodman, 169; Rydberg, 3177;* Belt Cañon, 1886, *R. S. Williams, 549;* Alhambra, 1892, *Kelsey:* Bozeman, 1886, *Tweedy, 1007;* Lewis & Clarke Co., *Mrs. Estella Muth;* Gallatin City, 1883, *F. Lamson-Scribner, 401.*

Panicularia pauciflora (Presl) Kuntze, Rev. Gen. Pl. **2**: 783: *Glyceria pauciflora* Presl, Rel. Haenk. **1**: 257 [Man. R. M. 424; Bot. Cal. **2**: 308].

In water at an altitude of about 2000 m. A rare plant.

MONTANA: Little Belt Mountains, near the pass, 1896, *Flodman, 174: Rydberg, 3329:* Spanish Basin, *3118:* West Gallatin, 1883, *Scribner, 404.*

YELLOWSTONE PARK: 1884, *Tweedy, 267:* East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3674.*

Puccinellia airoides (Nutt.) Wats. & Coulter in Gray, Man. Ed. 6, 668 [Ill. Fl. **1**: 215]; *Poa airoides* Nutt. Gen. **1**: 68; *Glyceria distans* Coulter, Man. R. M. 423; in part as to the western plant; *Atropis distans* Griseb.: Ledeb. Fl. Ross. **4**: 388 [Bot. Cal. **2**: 308].

It differs from *P. distans* in the more open panicle, with smaller spikelets, and in the second empty glume being more than half as long as the flowering glume.

MONTANA: Dillon, 1895, *Shear, 331;* Aug. 2, *Rydberg, 2298;* Manhattan, *2198;* Helena, *2135: Shear, 380;* Silver Bow, *359;* Melrose, *545;* Great Falls, 1887, *R. S. Williams, 575;* Crow Creek, 1883, *Scribner, 402;* Musselshell River, 1896, *Rydberg, 3440.*

YELLOWSTONE PARK: Yellowstone Lake, 1884, *Tweedy, 271;* 1885, *595;* Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 3675.*

Festuca octoflora Walter, Fl. Car. 81 [Ill. Fl. **1**: 216]; *Festuca tenella* Willd. Sp. Pl. **1**: 419 [Man. R. M. 424; Bot. Cal. **2**: 317]

In sandy meadows up to an altitude of 1800 m.

MONTANA: Alhambra, 1888, *Kelsey;* Great Falls, 1887, *R. S. Williams, 600;* 1883, *Scribner, 405;* Lewis and Clarke Co., *Mrs. Muth.*

Festuca ovina L. Sp. Pl. 73 [Man. R. M. 424; Ill. Fl. **1**: 217; Bot. Cal. **2**: 317].

The Rocky Mountain form of this species differs considerably from the European and Northeastern one, having a more open panicle and larger spikelets, and may be distinct. It is common on dry hills and table lands at an altitude of 1000–3000 m.

MONTANA: Lima, 1895, *Shear, 310, 314, 320* and *370; Rydberg, 2070, 2316:* Bozeman, July 24, *Shear, 475: Rydberg, 2231;* Little Belt Mts., 1896, *Flodman, 178;* Elk Mts., *179;* Spanish Basin, *180;* June 23, 1897, *Rydberg & Bessey, 3676:* 1896, *Rydberg, 3014, 3023, 3040, 3079, 3132:* Long Baldy, Little Belt Mts., *3386, 3387* and *3388.*

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 599:* 1884, *255* and *256:* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 3677.*

Festuca ovina polyphylla Vasey; Beal, Grasses of N. A. **2**: 597.

Characterized by its large tufts of very long and slender filiform leaves. At an altitude of 1000–2000 m.

MONTANA: Basin, 1892, *Kelsey:* Belt Cañon, 1887, *R. S. Williams, 590:* Spanish Creek, 1886, *Tweedy, 1003:* Lewis and Clarke Co., *Mrs. Muth:* Flathead Region, 1883, *H. B. Ayres.*

YELLOWSTONE PARK: 1884, *Tweedy, 252* and *256.*

* **Festuca pseudovina** Hack.; Wiesb. Oest. Bot. Zeit. **30**: 126; *Festuca ovina pseudovina* Hack. Mon. Fest. Eur. 89.

Distinguished by its narrow almost spiciform panicle and its nearly awnless flowering glumes. On mountain tops at an altitude of 2500–3000 m.

MONTANA: Little Belt Mts., near Barker, Aug. 18, 1896, *Flodman, 184; Rydberg, 3375:* Long Baldy, Aug. 19, *185, Rydberg.*

Festuca brachyphylla Schultes, Mant. 3: 646; *Festuca brevifolia* R. Br. App. Parry's Voy. Suppl. 289, not Muhl.: *F. ovina brevifolia* Wats. Bot. King's Exp. **5**: 389 [Man. R. M. 424].

On the tops of alpine peaks at an altitude of 2500–3000 m.

MONTANA: Long Baldy, Little Belt Mts., 1896, *Flodman, 177; Rydberg, 3378:* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 3679;* Mt. Chauvet, July 29, *3678* and *3680:* Yogo Baldy, 1896, *Rydberg, 3415:* Upper Marias Pass, 1883, *Canby, 380a:* Belt Mts., 1883, *Scribner, 410.*

YELLOWSTONE PARK: 1885, *Tweedy, 635.*

* Festuca vallicola.

Rootstock filiform; innovations extravaginal, few and slender: culm 6–10 dm. tall, slender, seldom much over 1 mm. in diameter, strict, generally very light-colored and shining, somewhat striate above; sheaths striate, closely embracing the stem, 6–12 cm. long, generally shorter than the internodes; ligule short, rounded at the apex, somewhat decurrent; blades filiform, involute, the basal sometimes 1 dm. long, those of the stem 4–8 cm. long: panicle narrow, about 5 cm. long, the lower branches sometimes 3 cm. in length; spikelets 4–7-flowered, 8–10 mm. long, on pedicels 1–3 mm. long; empty glumes unequal, the lower glume 2–3 mm. long, very narrow, almost subulate, strongly keeled, the upper one lanceolate, 4–5 mm. long, 3-nerved, acuminate; flowering glumes about 5 mm. long, ovate-lanceolate, indistinctly 5–7-nerved, almost smooth or minutely scabrous, tipped with an awn 2–4 mm. long: palet very narrow.

This has generally gone under the name of *F. rubra*, but it is distinct, at least from the Scandinavian plant. The latter is quite often tufted, has larger spikelets, broader glumes, looser sheaths, broad flat stem-leaves, and a much stouter stem. *F. vallicola*, so far as I know, never forms tufts or bunches, and the innovations are few. I doubt if *F. rubra* is found at all in the Rocky Mountain region. All specimens so named which I have seen from the northern Rockies belong to the present species. *F. vallicola* grows in wet meadows in the valleys of the mountain regions at an altitude of 1500–2000 m. The following specimens are referred here:

MONTANA: Deer Lodge, 1895, *Rydberg*, *2123*; Shear, *377*; Silver Bow, *Rydberg*, *2108* (type); Shear, *353*; Bozeman, *Shear*, *460* and *492*; *Rydberg*, *2223*; Mystic Lake, *2362*; *Shear*, *464* and *492*; Butte, *547*; Spanish Basin, 1896, *Rydberg*, *3157½*; Flodman, *186*; Smith River, 1883, Scribner, *409*.

WYOMING: Black Rock Creek, 1897, *Tweedy*, *75*.

Festuca campestris: *Festuca scabrella* Coulter, Man. R. M. 424; not Torr.; *F. scabrella major* Vasey, Cont. U. S. Nat. Herb. **1**: 278; not *F. nutans major* Vasey.

Dry valleys, plains and hillsides up to an altitude of 2000 m.

MONTANA: Silver Bow, 1895, *Shear*, *356*; *Rydberg*, *2106*; Belt Cañon, 1887, *R. S. Williams*, *599*; Bozeman Pass, 1883, *Scribner*, *382*, in part; Boulder Creek, *406*.

* **Festuca elatior** L. Sp. Pl. 75 [Ill. Fl. **1**: 217].

About the size of *F. campestris*, but with broad leaves and shorter peduncled spikelets. It is introduced from Europe and sometimes cultivated. In waste places.

MONTANA: Helena, 1895, *Shear, 388; Rydberg, 2141.*

* **Festuca confinis** Vasey, Bull. Torr. Bot. Club, **11**: 126: *Festuca Kingii* (S. Wats.) Scribn. Bull. U. S. Dept. Agric. Div. Agrost. 5: 36, 1897; not *F. Kingiana* Endl.; *Poa Kingii* S. Wats. Bot. King's Exp. **5**: 387.

A coarse bunch grass with broad stiff leaves and dioecious flowers. On hillsides and along brooks at an attitude of about 2000 m.

MONTANA: Lima, 1895, *Shear, 313; Rydberg, 2065, 2303;* Red Lodge, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy, 578;* Mammoth Hot Springs, *631.*

* **Festuca Jonesii** Vasey, Cont. U. S. Nat. Herb. **1**: 278.

A species with large flowers, long slender awns, and a long and drooping panicle. It somewhat resembles a *Bromus* in habit. In woods at an altitude of 1800 m.

MONTANA: Foot of Baldy, Bridger Mountains, July 24, 1895, *Shear, 465; Rydberg, 2228;* 1896, *3206;* Flathead River, 1883, *Canby, 381.*

Bromus ciliatus L. Sp. Pl. 76 [Man. R. M. 425: Ill. Fl. **1**: 219; Bot. Cal. **2**: 320].

In meadows up to an altitude of 2000 m.

MONTANA: Manhattan, 1895, *Shear, 431;* Bozeman, *Rydberg, 2227;* Madison River, *2275;* Sheep Creek, 1896, *Flodman, 200;* Sand Coulee, 1883, *Scribner, 416;* Belt Mountain, *414;* 1883, *Scribner, 411* (labeled var. *occidentalis*).

YELLOWSTONE PARK: 1884, *Tweedy, 265;* East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3683;* Slough Creek, 1885, *Tweedy, 589* (labeled var. *gracile* Scribn.).

* **Bromus ciliatus montanus** Vasey (Bot. Wheeler's Exp. **6**: 292, name only); Beal, Grasses of N. A. **2**: 619.

Panicle erect, spikelets 5–6-flowered.

MONTANA: East Gallatin Swamps, 1896, *Rydberg, 3170.*

* **Bromus ciliatus scariosus** Scribner, Bull. U. S. Dept. Agric. Div. Agrost. 13: 46.

A small form with slender leaves, weak stem and conspicuously scarious tips of the glumes.

MONTANA: Sheep Creek, 1896, *Rydberg*, *3304;* Spanish Basin, *3114; Flodman*, *198*.

Bromus Porteri (Coulter) Nash, Bull. Torr. Bot. Club, **22**: 512 [Ill. Fl. **1**: 221]; *Bromus Kalmii Porteri* Coulter, Man. Bot. Rocky Mt. Region 425.

It is rather nearer related to *B. ciliatus* than to *B. breviaristatus*. Both empty glumes, however, are 3-nerved and the flowers hairy all over. In meadows and woods at an altitude of 1200–2000 m.

MONTANA: Little Belt Mts., 1896, *Flodman*, *201;* Helena, 1889, *Kelsey;* Gallatin Co., 1886, *Tweedy*, *1001;* Jack Creek, July 14, 1897, *Rydberg & Bessey*, *3682;* Indian Creek, Aug. 22, *3686;* Priests' Pass, 1883, *Canby*, *384*.

YELLOWSTONE PARK: Cache Creek, 1885, *Tweedy*, *588;* 1884, *266;* Electric Peak, Aug. 20, 1897, *Rydberg & Bessey*, *3684* and *3685*.

* **Bromus Kalmii** A. Gray, Man. 600 [Ill. Fl. **1**: 221].

Like *B. Porteri*, but the upper empty glume 5–7-nerved. In meadows up to an altitude of 1800 m.

MONTANA: Bozeman, 1895, *Rydberg*, *2227½;* Lima, *2315;* Spanish Basin, 1896, *Rydberg*, *3047;* Dry Fork of Belt Creek, *3361;* Castle, *3253;* 1883, *Scribner*, *415*.

YELLOWSTONE PARK: Lower Falls, 1871, *Hayden*.

* **Bromus Kalmii occidentalis** Vasey; Beal, Grasses, **2**: 624.

Blades narrow; floral glumes with shorter hairs.

MONTANA: *Canby & Scribner*, *384*.

* **Bromus hordeaceus** L. Sp. Pl. 77 [Ill. Fl. **1**: 222]; *Bromus mollis* L. Sp. Pl. Ed. 2, 112.

Somewhat resembling the preceding, but the flowering glumes short-pubescent and the panicle more contracted. In waste places, introduced from Europe.

MONTANA: Garrison, 1895, *Rydberg*, *2126;* Bozeman, 1896, *Rydberg*.

Bromus secalinus L. Sp. Pl. 76 [Man. R. M. 425; Ill. Fl. **1**: 222; Bot. Cal. **2**: 319].

In waste places, introduced.

MONTANA: Garrison, 1895, *Shear*, *368;* Bozeman, *453; Rydberg*, *2214*.

* **Bromus brizaeformis** Fisch. & Mey. Ind. Sem. Hort. Petrop. 3 : 30 [Ill. Fl. **1** : 223].

An introduced plant characterized by its flat spikelets and short and broad awnless glumes.

MONTANA : 1883, *Scribner, 417*.

* **Bromus Pumpellianus** Scribner, Bull. Torr. Bot. Club, **15** : 9.

This is distinguished by the erect branches of the panicle, large brownish or purplish spikelets and the auricled bases of the leaf-blades. It is common on bench lands and in dryer valleys to an altitude of 2500 m.

MONTANA : Little Belt Mts., 1896, *Flodman, 203* and *204:* Tiger Butte, 1886, *R. S. Williams, 552;* 1883, *Scribner, 418:* Gallatin Co., 1886, *Tweedy, 1002:* Dry Fork of Belt Creek, 1896, *Rydberg, 3356* and *3362;* Little Belt Mts., *3383:* Elk Mountains, *3271:* Flathead Valley, 1883, *Canby, 385*.

YELLOWSTONE PARK : 1885, *Tweedy, 587:* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 3687*.

* **Bromus Pumpellianus Tweedyi** Scribner, Bull. U. S. Dept. Agric. Div. Agrost. 5 : 37.

Culm stout, 2 feet high : leaves short ; panicle dense : spikelets small ; flowering glumes very villous.

MONTANA : Lima, 1885, *Shear, 568: Rydberg, 2304*.

YELLOWSTONE PARK : 1885, *Tweedy, 518:* Soda Butte, 1885, *587*.

Bromus breviaristatus (Hook.) Buckl. Proc. Acad. Phila. **1862** : 98 [Man. R. M. 425 ; Ill. Fl. **1** : 223] : *Ceratochloa breviaristata* Hook. Fl. Bor. Am. **2** : 253 [Bot. Cal. **2** : 321].

Common in dryer valleys, on bench lands and hillsides up to an altitude of 2200 m.

MONTANA : Deer Lodge, 1895, *Shear, 378: Rydberg, 2119:* Lima, *2314; Shear, 569;* Bozeman, *449* and *476; Rydberg, 2213, 2233½* and *2247;* Manhattan, *Shear, 415:* Bridger Mountains, 1896, *Flodman, 196:* Sheep Creek, *188:* Belt Cañon, 1887, *R. S. Williams, 604:* Alhambra, 1888, *Kelsey;* Gallatin Co., 1886, *Tweedy, 1000:* Bozeman, 1896, *Rydberg, 3000* and *3006:* Spanish Basin, *3028, 3037, 3104, 3109, 3155:* East Gallatin Swamps, *3171:* Bridger Pass, *3219:* Castle, *3252* and *3259:* Dry Fork of Belt Creek, *3355:* Spanish Basin, July 23, 1897, *Rydberg & Bessey, 3687a* and *3688;*

Jack Creek, July 14, *3689;* Sixteen Mile Creek, 1883, *Scribner, 412;* Gallatin City, 1883, *Scribner, 413* (?).

YELLOWSTONE PARK: 1884, *Tweedy, 264;* Slough Creek, 1885, *586.*

* **Bromus Aleutensis** Trin.; Ledeb. Fl. Ross. **4**: 361.

Differs from *B. breviaristatus* in the glabrous glumes and sheaths, In meadows at an altitude of about 2000 m.

MONTANA: Lima, 1895, *Shear, 560½;* Sheep Creek, Aug. 8, 1896, *Flodman, 187; Rydberg, 3308.*

Agropyron spicatum (Pursh); *Festuca spicata* Pursh, Fl. Am. Sept. 83, 1814; *Agropyrum divergens* Nees; Steud. Syn. Plant. Glum. 347, 1855; S. & S. Bull. U. S. Dept. Agric. Div. Agrost. 4: 26; *Agropyrum strigosum* Coulter, Man. R. M. 426; *Triticum strigosum* Thurber, Bot. Cal. **2**: 324.

Common on dry hills up to an altitude of 2500 m. Scribner and Smith have taken up the name *A. spicatum* for another species. I have seen Lewis' specimen from which *Festuca spicata* Pursh was described; it is preserved in the Philadelphia Academy, and there is no doubt that it is the same plant that has been known as *A. divergens.* Pursh's original description calls for a long scabrous awn, which shows that a mistake was made when the name *A. spicatum* was applied to a member of the *A. repens* group.

MONTANA: Lima, 1895, *Shear, 326, 330* and *559;* Melrose, July 6, *Rydberg, 2103;* Silver Bow, *2110;* Bozeman, *Shear, 472* and *474;* Smith River, 1883, *Scribner, 420* and *423;* Spanish Basin, 1896, *Flodman, 227, 237, 243;* Little Belt Mts., *236;* Lewis & Clarke Co., 1892, *Kelsey;* Great Falls, 1887, *R. S. Williams, 586;* Spanish Basin, 1896, *Rydberg, 3008, 3027, 3038, 3044½, 3143;* Elk Mts., *3297;* Little Belt Mts., *3370, 3371,* and *3382;* Billings, 1898, *Williams & Griffith;* Pleasant Valley, 1883, *H. B. Ayers.*

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy, 623; C. C. Parry, 299.*

* **Agropyron spicatum tenuispicum** (S. & S.): *Agropyron divergens tenuispicum* Scribner & Smith, Bull. U. S. Dept. Agric. Div. Agrost. 4: 27. 1897.

Spike slender and flexuous; leaves flat, in age involute. Same range as the species.

MONTANA: Lima, 1895, *Rydberg, 2074;* Melrose, *Shear, 347;* Helena, *Rydberg, 2147;* Jack Creek, July 14, 1897, *Rydberg &*

Bessey, *3693*; Spanish Basin, June 24, *3692*; Pony, July 6, *3691*; Elk Mts., 1896, *Flodman*, *239*; Little Belt Mts., *241*; *Rydberg*, *3316*; Spanish Basin, *3089*; Nevada Creek, 1882, *Canby*, *388*.

YELLOWSTONE PARK: 1895, *F. Tweedy*, *623*.

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey*, *3690*.

* **Agropyron Vaseyi** Scribn. & Smith, Bull. U. S. Dept. Agric. Div. Agrost. 4: 27.

It differs from *A. divergens* by its shorter and narrower leaves, rigid and wiry culms and smaller spikelets.

MONTANA: Townsend, 1895, *Rydberg*, *2164*; Dillon, *2299*; Lima, Aug. 5, *2301*; 1880, *Watson*, *461*.

* **Agropyron Richardsoni** (Trin.) Schrad. as a synonym under *Triticum Richardsonii* Trin., Linnaea, **12**: 467: *Agropyrum unilaterale* Cassidy, Bull. Colo. Exp. Sta. 12: 63; not Beauv.

Differs from *A. caninum* by its stout erect spike and longer awns. On bench lands at an altitude of 1000–2000 m.

MONTANA: Elk Mts., near Black Hawk, Aug. 5, 1896, *Flodman*, *231*; Cliff Lake, July 27, 1897, *Rydberg & Bessey*, *3706*; Sun River Cañon, 1887, *R. S. Williams*, *589*; Little Belt Mts., 1896, *Rydberg*, *3352*; Smith River, 1883, *Scribner*, *425a*.

* **Agropyron Richardsonii ciliatum** Scribn. & Smith Bull. U. S. Dept. Agric. Div. Agrost. 4: 29. 1897.

Leaf sheath and blade pilose pubescent. At an altitude of 1300 m.

MONTANA: Belt Mountains, 1883, *Scribner*, *422*.

Agropyron caninum (L.) R. & S. Syst. **2**: 756 [Man. R. M. 426; Ill. Fl. **1**: 228]; *Triticum caninum* L. Sp. Pl. 86. 1753 [Bot. Cal. **2**: 324].

Common in meadows and on bench lands to an altitude of 2000 m.

MONTANA: Manhattan, 1895, *Shear*, *416*; *Rydberg*, *2176*; Bozeman, *Shear*, *452*; Melrose, Aug. 1, *542*; Cliff Lake, July 27, 1897, *Rydberg & Bessey*, *3710*; Forks of the Madison, July 26, *3709*; East Gallatin Swamps, 1896, *Rydberg*, *3185* and *3191*; *Flodman*, *223*; Spanish Basin, *208*; *Rydberg*, *3158*.

YELLOWSTONE PARK: Cache Creek, 1885, *Tweedy*, *625*.

IDAHO: Mt. Chauvet, July 27, 1896, *Rydberg & Bessey*, *3704½*.

* **Agropyron tenerum** Vasey, Coult. Bot. Gaz. **10**: 258 [Ill. Fl. **1**: 227].

Differs from *A. violaceum* by the long and slender spike and the narrow 3–5-nerved empty glumes. In dry soil up to an altitude of 2500 m.

MONTANA: Townsend, 1895, *Rydberg, 2159; Shear, 404:* Manhattan, *Rydberg, 2177:* Butte, *Shear, 546:* Lima, *572;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 3699:* Little Belt Mts., 1896, *Flodman, 218: Rydberg, 3353:* Spanish Basin, *3160* and *3164;* East Gallatin Swamps, *3182:* Castle, *3251:* Flathead Region, 1883, *H. B. Ayres, CCXLIX;* Smith River, 1883, *Scribner, 424.*

YELLOWSTONE PARK: Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey, 3700* and *3702;* East DeLacy's Creek, Aug. 10, *3694, 3695* and *3701:* Yellowstone Falls, Aug. 14, 1897, *3697:* 1884, *Tweedy, 250* and *251.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 3703.*

Agropyron violaceum (Hornem.) Vasey, Gram. U. S., Spec. Rept. Dept. Agric. 63: 45 [Man. R. M. 426; Ill. Fl. **1**: 227]; *Triticum violaceum* Hornem. Fl. Dan. *t. 2044* [Bot. Cal. **2**: 325].

On mountain sides at an altitude of 2000–3000 m.

MONTANA: Bridger Mts., 1896, *Flodman, 224;* Castle, 1896, *Rydberg, 3234* and *3261;* Lone Mountain, 1886, *Tweedy, 1011:* Jefferson City, 1883, *Scribner, 421.*

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 3696.*

IDAHO: Mt. Chauvet, July 27, 1897, *Rydberg & Bessey, 3704.*

* **Agropyron violaceum latiglume** Scribn. & Smith, Bull. U. S. Dept. Agric. Div. Agrost. 4: 30. 1897.

Empty glumes with broad scarious margins; flowering glume rounded on the back, densely pubescent.

MONTANA: Lone Mountain, Gallatin Co., 1886, *F. Tweedy, 1011* (type in Nat. Herb.); Priests' Pass, 1883, *Canby, 386.*

* **Agropyron violaceum andinum** Scribn. & Smith, Bull. U. S. Dept. Agric. Div. Agrost. 4: 30. 1897.

Culm geniculate, densely tufted, weak: spike compact; awns as long as or longer than the flowering glumes. On the tops of the alpine peaks at an altitude of 2500–3000 m.

MONTANA: Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 3705.*

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 3698.*

* **Agropyron Gmelini** (Griseb.) Scribn. & Smith, Bull. U. S. Dept. Agric. Div. Agrost. 4: 30. 1897 [Ill. Fl. **3**: 508]; *Trisetum caninum Gmelini* Griseb.: Ledeb. Ill. Fl. Ross. **3**: 248.

This differs from *A. violaceum* and its allies in that the basal culm leaves are shorter than the upper ones. Dry ground at an altitude of about 2000 m.

MONTANA: Deer Lodge, 1895, *Shear, 379:* Baldy, Bridger Mountains, *Rydberg, 2233.*

* **Agropyron Gmelini Pringlei** Scribn. & Smith, Bull. U. S. Dept. Agric. Div. Agrost. 4: 31. 1897.

Low, tufted, geniculate, leaves 5–10 cm. long. An alpine plant growing at an altitude of 3000 m.

YELLOWSTONE PARK: 1893, *J. M. Rose, 234* and *695.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 3717a.*

Agropyron Scribneri Vasey, Bull. Torr. Bot. Club, **10**: 128 [Man. R. M. 426].

An alpine species growing at an altitude of about 3000 m.

MONTANA: Little Belt Mts., 1883, *Scribner, 427;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 3711.*

YELLOWSTONE PARK: Mt. Holmes, 1884, *Tweedy, 270.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 3712* and *3713.*

* **Agropyron albicans** Scribn. & Smith, Bull. U. S. Dept. Agric. Div. Agrost. 4: 32.

Related to *A. dasystachum*, but distinguished by divergent bent awn.

MONTANA: Yogo Gulch, 1896, *Rydberg, 3405: Flodman, 235:* Elk Mountain, near Black Hawk, Aug. 5, *Flodman, 207: Rydberg, 3256.*

Agropyron Smithii; *Agropyron spicatum* Scribn. & Smith, Bull. U. S. Dept. Agric. Div. Agrost. 4: 33 [Ill. Fl. **3**: 507]; *Agropyrum repens* Coulter, Man. 425, in part.

Differing from *A. repens* in the acute, compressed, diverging spikelets and striate, bluish-green, glaucous leaves: common in meadows of the prairie regions, reaching in the valleys an altitude of 2000 m.

See under *A. spicatum* above. I name this species in honor of my friend J. G. Smith, of the U. S. Department of Agriculture who has contributed more than any one else to the knowledge of our *Agropyrons.*

MONTANA: Logan, 1895, *Shear, 514: Rydberg, 2271;* Elk Mts., Castle, 1896, *Flodman, 222; Rydberg, 3256;* Madison Co., *Mrs. McNulty;* Gallatin City, 1883, *Scribner, 425;* Flathead Lake, 1883, *Canby, 389;* Otter Creek, *Scribner, 426.*

* **Agropyron molle** (Scribn. & Smith). *Agropyron spicatum molle* S. & S., Bull. U. S. Dept. Agric. Div. Agrost. 4: 33.

Empty and flowering glumes and rachis villous-pubescent. I regard this as a good species intermediate between the preceding and the following. Rather rare.

MONTANA: Helena, 1895, *Shear, 386;* Gallatin, July 29, *530:* Lima, Aug. 5, *Rydberg, 2317;* East Gallatin Swamps, 1896, *Rydberg, 3193.*

***Agropyron dasystachyum subvillosum** Scribner & Smith, Bull. U. S. Dept. Agric. Div. Agrost. 4: 33.

It differs from *A. repens*, etc., in the flowering glumes, which are densely pubescent. The variety differs from the typical *A. dasystachyum* of the East in being more slender, a shorter and more crowded spike, and shorter spikelets. Meadows to an altitude of 2000 m.

MONTANA: 1890, *Williams;* Deer Lodge, 1895, *Rydberg, 2130;* Red Rock, *Shear, 549:* Castle, 1896, *Flodman, 219; Rydberg, 3257;* Sixteen Mile Creek, 1883, *Scribner, 419.*

YELLOWSTONE PARK: Cache Creek, 1885, *F. Tweedy, 621.*

* **Agropyron pseudorepens** Scribn. & Smith, Bull. U. S. Dept. Agric. Div. Agrost. 4: 34.

Differs from *A. repens* by the empty glumes, which are about as long as the spikelet, the harsher leaves and narrower spikelets. Common in meadows throughout the prairie region and ascending to an altitude of 2000 m.

MONTANA: 1885, *L. F. Ward;* 1893, *F. L. Scribner, 424;* Dillon, 1895, *Shear, 340; Rydberg, 2088;* Helena, *Shear, 383;* Manhattan, *411* and *440:* Jack Creek, July 14, 1897, *Rydberg & Bessey, 3708;* Elk Mts., 1896, *Flodman, 220;* Sheep Creek, *210;* Spanish Basin, *214* and *221;* Little Belt Mts., *216* and *217:* Madison Co., *Mrs. McNulty;* Spanish Basin, 1896, *Rydberg, 3090, 3129* and *3142;* Elk Mountains, *3274;* Sheep Creek, *3305;* Yogo Gulch, *3420* and *3426.*

YELLOWSTONE PARK: 1893, *J. N. Rose*, 224; Helena, 1891, *Kelsey.*

* **Agropyron riparium** Scribn. & Smith, Bull. U. S. Dept. Agric. Div. Agrost. 4 : 35. 1897.

Glaucous, with narrow involute leaves and empty glumes that are less then one-half the length of the spikelet. River banks, rare.

MONTANA : Deer Lodge, *Shear*, *372 :* Garrison, *369 : Rydberg*, *2127* (type) ; East Gallatin Swamps, 1896, *Flodman*, *211* (?).

* **Hordeum aegiceras** (E. Mey.) Royle ; Walp. Ann. **3** : 787 ; *Critho aegiceras* E. Mey. Hort. Reg. Sem. **1848** : 5.

The pearl barley is sometimes found escaped from cultivation.

MONTANA : Wolf Creek, July 27, 1897, *Rydberg & Bessey*, *3720*.

Hordeum jubatum L. Sp. Pl. 85 [Man. R. M. 427 : Ill. Fl. **1** : 229 ; Bot. Cal. **2** : 324].

Common on prairies to an altitude of 2000 m. A troublesome weed.

MONTANA : Deer Lodge, 1895, *Shear*, *375 : Rydberg*, *2117 ;* Great Falls, 1886, *R. S. Williams*, *547 ;* Custer Co., *Mrs. Light ;* Madison Co., *Mrs. McNulty ;* Bozeman, 1887, *Tweedy :* East Gallatin Swamps, 1896, *Rydberg*, *3184 ;* Jefferson City, 1883, *Scribner*, *431 ;* Gallatin City, *428*.

Hordeum nodosum L. Sp. Pl. Ed. 2, 126 [Man. R. M. 427 : Ill. Fl. **1** : 228 ; Bot. Cal. **2** : 324] ; *Hordeum pratense* Huds. Fl. Angl. Ed. 2, 56. 1762.

Common in meadows up to an altitude of 2500 m.

MONTANA : Dillon, 1895, *Shear*, *336 : Rydberg*, *2082 ;* Melrose, *2099 ;* Mystic Lake, *Shear*, *488 ;* Lima, *565 :* Great Falls, 1891, *R. S. Williams*, *584 ;* Big Hole Valley, *Watson*, *1880 ;* Cliff Lake, July 27, 1897, *Rydberg & Bessey*, *3718 ;* Spanish Basin, 1896, *Rydberg*, *3045*, *3123*, *3165 ;* Jefferson City, 1883, *Scribner*, *433*.

YELLOWSTONE PARK : 1884, *Tweedy*, *247 ;* East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey*, *3719*.

* **Hordeum Montanense** Scribner ; Beal, Grasses N. Am. **2** : 644 ; S. & S. Bull. U. S. Dept. Agric. Div. Agrost. 4 : 25.

Differs mainly from *H. nodosum* in being somewhat taller, having longer awns and the florets of the central spikelet not sessile.

MONTANA : Sand Coulee, 1883, *Scribner*, *430 :* Horned Creek, *429* (?).

Sitanion elymoides Rafin. Journ. Phys. **89** : 103, 1819 ; *Elymus Sitanion* Schultes, Mant. **2** : 426 [Man. R. M. 427 : Bot. Cal. **2** :

327]; *Elymus elymoides* Sweezy, Neb. Fl. Pl. 15 [Ill. Fl. **1**: 232].

On the mountains to an altitude of 3000 m.

MONTANA: Spanish Peaks, 1896, *Flodman*, *252;* Helena, 1892, *Kelsey;* Bozeman, 1887, *Tweedy;* Indian Creek, 1883, *Scribner*, *437;* Spanish Basin, 1896, *Rydberg*, *3091* and *3133;* Sheep Creek, *3298;* Little Belt Mountains, *3381;* Belt Mountains, 1883, *Scribner*, *437;* Billings, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy*, *626;* Lower Geyser Basin, August 4, 1897, *Rydberg & Bessey*, *3714* and *3715;* Upper Falls, August 14, *3716.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *3717.*

Elymus Canadensis L. Sp. Pl. 83 [Man. R. M. 427; Ill. Fl. **1**: 231; Bot. Cal. **2**: 327].

Along streams to an altitude of 1800 m.

MONTANA: Logan, 1895, *Rydberg*, *2270; Shear*, *505;* Gallatin, *Rydberg*, *2284–2287;* East Gallatin Swamps, 1896, *Flodman*, *254; Rydberg*, *3172;* Little Belt Mts., *3351;* Smith River, 1883, *Scribner*, *434.*

* **Elymus robustus** S. & S., Bull. U. S. Dept. Agric. Div. Agrost. 4: 37.

Differs from *E. Canadensis* in the stouter habit, the larger spikes, the numerous (3–5) spikelets at each node and the more flexuous or bent awn.

MONTANA: Helena, 1892, *Kelsey.*

Elymus Macounii Vasey, Bull. Torr. Bot. Club, **13**: 119. 1896 [Ill. Fl. **1**: 231].

It is a slender grass resembling somewhat *Agropyrum caninum* in habit, and has mostly only one spikelet at each node. It occurs in meadows along the rivers and ascends to an altitude of 2000 m.

MONTANA: Townsend, 1895, *Shear*, *403; Rydberg*, *2168;* Bozeman, *Shear*, *450* and *466;* Logan, *506* and *512;* Red Rock, *550;* Smith River, 1883, *Scribner*, *439;* Musselshell River, 1896, *Rydberg*, *3437.*

Elymus glaucus Buckl. Proc. Acad. Phila. **1862**: 99 [Ill. Fl. **1**: 231]; *Elymus Americanus* V. & S.; Macoun, Cat. Can. Pl. **4**: 245; *Elymus Sibiricus Americanus* Wats. & Coult. in A. Gray, Man. Ed. **6**: 673. 1890.

Characterized by its long, straight awn, narrow spike and glabrous spikelets. It is distinguished from the next by its broader leaves, larger spikelets and awn not divergent.

MONTANA: Baldy, Bridger Mountains, 1895, *Rydberg, 2225;* Spanish Peaks, 1896, *Flodman, 249;* Little Belt Mts., *Rydberg, 3354* and *3357; Flodman, 255;* Jack Creek, July 14, 1897, *Rydberg & Bessey, 3722;* Forks of the Madison, July 26, *3721;* Meadow Creek, 1886, *Tweedy, 1012;* Belt Mountains, 1883, Scribner, *440;* Horned Creek, *436;* Little Belt Pass, 1896, *Flodman, 248; Rydberg, 3345;* Bridger Mts., *Flodman, 246; Rydberg, 3208;* Elk Mountains, *3276;* Spanish Basin, *3088.*

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3707.*

* **Elymus inovatus** Beal, Grasses of N. A. **2**: 650.

This is characterized by its pubescent spikelets, its small empty glumes, which are mere bristles, short ligules and scabrous leaves. It is a near relative to *E. mollis* and *E. Brownii.* The latter is found in the Black Hills of South Dakota and may be found in Montana; it is characterized by its short spike, broader empty glumes and more slender habit.

MONTANA: Sims River, 1887, *R. S. Williams,* acc. to Beal.

* **Elymus Virginicus minor** Vasey; Rydb. Cont. U. S. Nat. Herb. **3**: 193.

Differs from *E. Virginicus* in being more slender, with a long-exserted, erect and slender spike. In alluvial soil to an altitude of 1500 m.

MONTANA: Sand Coulee, 1883, *Scribner, 438.*

Elymus condensatus Presl, Reliq. Haenk. **1**: 265. 1830 [Man. R. M. 427; Ill. Fl. **1**: 232; Bot. Cal. **2**: 326].

In dry soil, along roads, on hillsides, etc., to an altitude of 2000 m.

MONTANA: Helena, 1895, *Rydberg, 2136; Shear, 381;* Townsend, *391;* Bozeman, *471;* Spanish Basin, 1896, *Flodman, 250; Rydberg, 3151;* Helena, 1892, *Kelsey;* Yogo Gulch, 1896, *Rydberg, 3406;* Gallatin City, 1883, *Scribner, 435.*

* **Elymus triticoides** (Nutt.) Buckl. Proc. Acad. Sc. Phila. **1862**: 99; *Elymus condensatus triticoides* Thurber, Bot. Cal. **2**: 326. *E. Virginicus submuticus* Hook. Fl. Bor. Am. **2**: 255 (?).

It is smaller than the preceding; the spikelets are smaller, generally only two and often but one at each node, and the flowering glumes of a firmer texture. It seldom forms big bunches like *E. condensatus* and grows more commonly in the meadows.

MONTANA: Dillon, 1895, *Shear, 332; Rydberg, 2076, 2300;* Madison River, *2274* and *2279.*

CYPERACEAE.

Cyperus inflexus Muhl. Desc. Gram. 16 [Ill. Fl. **1**: 237]: *Cyperus aristatus* Boeckl. Linnaea, **35**: 500; not Rottb. [Man. R. M. 366; Bot. Cal. **2**: 214].

In sandy soil at an altitude of 1500 m.

MONTANA: Big Timber, 1892, *Mrs. Busha.*

* **Cyperus acuminatus** Torr. & Hook. Ann. Lyc. N. Y. **3**: 435 [Ill. Fl. **1**: 239; Bot. Cal. **2**: 214].

In moist sandy soil at an altitude of about 1000 m.

MONTANA: Great Falls, 1891, *R. S. Williams, 862.*

Eleocharis palustris (L.) R. Br. Prod. 224. [Man. R. M. 369; Ill. Fl. **1**: 251; Bot. Cal. **2**: 221]; *Scirpus palustris* L. Sp. Pl. 47.

Common in swamps up to an altitude of 2500 m.

MONTANA: Manhattan, 1895, *Shear, 408; Rydberg, 2208;* Dillon, *2079;* Townsend, *2157;* Great Falls, 1886, *R. S. Williams, 499.*

YELLOWSTONE PARK: Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey, 3809* and *3810;* Hot Springs, 1885, *Tweedy, 665.*

* Eleocharis thermalis.

Eleocharis olivacea Coulter, Man. R. M. 369 in part; not Torr.

Perennial from a slender creeping rootstock, mostly tufted and matted, yellowish green; culm 3–10 cm. high, somewhat flattened, striate; upper sheath with a hyaline limb; head obovate, obtuse, about 4 mm. long and 3 mm. in diameter, light yellowish green; scales very thin, ovate, acutish; achenes lenticular, broadly obovate, dark brown, smooth and shining, about 1 mm. long, about 4 times as long as the conic acute tubercle.

This is nearest related to *E. ochreata* and *E. olivacea*, but differs from both in the obtuse spikes and the light green and usually yellowish culm and spike. From the former, it differs in the non-triangular culm, and from the latter in the light-colored scales. It grows in the warm streams and pools, and is generally immersed.

The characters of the fruit are taken from Tweedy's specimens, as my own are too young.

YELLOWSTONE PARK: East Fork of Firehole River, 1884, *Tweedy, 222;* Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 3812.*

MONTANA: Mud Springs, 1881, *T. C. Porter* (Hayden Survey).

Eleocharis acicularis (L.) R. Br. Prod. 224 [Man. R. M. 369; Ill. Fl. **1**: 252; Bot. Cal. **2**: 221]; *Scirpus acicularis* L. Sp. Pl. 48.

In sandy wet soil up to an altitude of 2500 m.

MONTANA: Manhattan, 1895, *Rydberg, 2206;* Little Rocky Mountains, 1889, *Dr. V. Havard;* Great Falls, 1886, *R. S. Williams, 500;* Teton River, 1883, *Scribner, 302.*

YELLOWSTONE PARK: Turbid Lake, 1885, *Tweedy, 664.*

* **Eleocharis rostellata** Torr. Fl. N. Y. **2**: 347 [Ill. Fl. **1**: 256: Bot. Cal. **2**: 222].

In water at an altitude of 1500 m.

MONTANA: East Gallatin Swamps, 1896, *Rydberg, 3176.*

Scirpus pauciflorus Lightf. Fl. Scot. 1078 [Ill. Fl. **1**: 262]; *Eleocharis pauciflorus* Link, Hort. Berol. **1**: 284 [Man. R. M. 369: Bot. Cal. **2**: 221].

In sandy, wet places up to an altitude of 2500 m.

MONTANA: Sun River Cañon, 1887, *R. S. Williams, 724.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 3811.*

Scirpus Americanus Pers. Syn. **1**: 68 [Ill. Fl. **1**: 265]; *Scirpus pungens* Vahl. Enum. **2**: 255 [Man. R. M. 266; Bot. Cal. **2**: 218].

In sloughs, especially in saline soil up to an altitude of 1500 m.

MONTANA: Townsend, 1895, *Rydberg, 2153;* Great Falls, 1886, *R. S. Williams, 501;* Teton River, 1883, *Scribner, 303.*

Scirpus lacustris L. Sp. Pl. 48 [Man. R. M. 367; Ill. Fl. **1**: 266; Bot. Cal. **2**: 217]; *Scirpus validus* Vahl, Enum. **2**: 268.

In water up to an altitude of 1500 m.

MONTANA: Madison River, 1895, *Rydberg, 2277; Townsend, 2148; Shear, 397;* Logan, July 27, *521;* East Gallatin Swamps, 1896, *Flodman, 259; Rydberg, 3168;* Great Falls, 1886, *R. S. Williams, 502.*

Scirpus lacustris occidentalis Wats. Bot. Cal. **2**: 218 [Man. R. M. 367].

In water up to an altitude of 2000 m.

MONTANA: Helena, 1890, *Kelsey;* Lower Gallatin Basin, 1886, *Tweedy, 1044;* Big Hole River, 1888, *96;* Teton River, 1883, *Scribner.*

Scirpus campestris Britton, Ill. Fl. **1**: 267; *Scirpus fluviatilis* Coulter, Man. R. M. 367, in part, not L.

In salt marshes in the prairie region.

MONTANA: Fort Shaw, *R. S. Williams, 498.*

Scirpus atrovirens Muhl. Gram. 43 [Man. R. M. 368; Ill. Fl. **1**: 269; Bot. Cal. **2**: 219].

In bogs and streams within the prairie regions.

MONTANA: Missouri River, 1883, *Scribner, 305.*

Scirpus microcarpus Presl, Rel. Haenk. **1**: 195 [Ill. Fl. **1**: 269]; *Scirpus sylvaticus digynus* Boeckl. Linnaea, **36**: 727 [Man. R. M. 368; Bot. Cal. **2**: 219].

In swamps and streams up to an altitude of 1500 m.

MONTANA: Dillon, 1895, *Rydberg, 2083:* Logan, *Shear, 520;* Manhattan, *429;* Townsend, *Rydberg, 2165; Nuttall, 4;* Bozeman, 1886, *Tweedy, 1045;* Box Elder Creek, 1886, *R. S. Williams, 504;* East Gallatin Swamps, 1896, *Rydberg, 3201.*

* **Eriophorum russeolum** Fries, Novit. Mant. **3**: 67 [Ill. Fl. **1**: 272].

It is characterized by its single head and the bristles which turn reddish brown. In bogs at an altitude of 2500 m.

YELLOWSTONE PARK: Sour Creek, 1885, *Tweedy, 663.*

Eriophorum polystachyum L. Sp. Pl. 52 [Man. R. M. 368; Ill. Fl **1**: 273; Bot. Cal. **2**: 220].

In bogs at an altitude of 1500–2000 m.

MONTANA: Twin Bridges, 1892, *Mrs. H. M. Fitch:* Big Hole Valley, 1800, *Watson.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 288.*

Eriophorum gracile Koch; Roth, Catal. Bot. **2**: 259 [Man. R. M. 368; Ill. Fl. **1**: 273; Bot. Cal. **2**: 220].

In bogs up to an altitude of 1000 m.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 940.*

* **Carex monile colorata** Bailey, Mem. Torr. Bot. Club, **1**: 39.

Smaller than the eastern typical form; spikes shorter and dark brown. Meadows at an altitude of 2300 m.

YELLOWSTONE PARK: Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey, 3739.*

Carex utriculata Boott; Hook. Fl. Bor. Am. **2**: 221 [Man. R. M. 383; Ill. Fl. **1**: 297; Bot. Cal. **2**: 252.]

In wet meadows and swamps up to an altitude of 2500 m.

MONTANA: Dillon, 1895, *Rydberg, 2085;* Spanish Creek, 1886, *Tweedy, 1040:* Park Co., 1887; Box Elder Creek, 1886, *R. S. Williams, 460;* Smith River, 1883. *Scribner, 325:* Little Belt Mts., 1882, *Canby;* Swimming Women Creek, 1882, *Canby;* Big Hole Valley, 1880, *Watson.*

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 3738:* 1884, *Tweedy, 214, 215* and *217.*

Carex utriculata minor Boott; Hook. Fl. Bor. Am. **2**: 221 [Man. R. M. 384].

Occurs with the species.

MONTANA: Dillon, *Rydberg, 2084:* Mystic Lake, *Shear, 485: Rydberg, 2237* and *2241:* Forks of the Madison, July 26, 1897; *Rydberg & Bessey, 3742:* Spanish Basin, July 1. *3747:* Gallatin Co., 1886, *Tweedy, 1041.*

YELLOWSTONE PARK: East De Lacy's Creek, Aug., 1897, *Rydberg & Bessey, 3746.*

Carex hystricina Muhl.; Willd. Sp. Pl. **4**: 282 [Man. R. M. 382; Ill. Fl. **1**: 300].

Wet meadows at an altitude of less than 1000 m.

MONTANA: Lower Sand Coulee, 1891, *R. S. Williams, 863.*

Carex filiformis L. Sp. Pl. 976 [Ill. Fl. **1**: 305; Man. R. M. 381].

In meadows, rare.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 951.*

Carex lanuginosa Michx. Fl. Bor. Am. **2**: 175 [Ill. Fl. **1**: 305]; *Carex filiformis latifolia* Boeckl. Linnaea, **47**: 309 [Man. R. M. 381; Bot. Cal. **2**: 250].

Common in wet meadows and sloughs up to an altitude of 2000 m.

MONTANA: Townsend, 1895, *Rydberg, 2156:* Logan, *2273:* Manhattan, *2183* and *2188:* Red Rock, *2090* and *2093:* Bozeman, *Shear, 451;* Belt Park, 1886, *R. S. Williams, 446:* Bozeman, 1886, *Tweedy, 1034;* Sixteen Mile Creek, 1883, *Scribner, 323:* Spanish Basin, 1896, *Rydberg, 3055;* Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 3741:* Cliff Lake, July 27, *4745;* Grasshopper Valley, 1880, *Watson;* Missoula, 1880, *Watson.*

Carex alpina Swartz; Lilj. Sw. Fl. Ed. 2, 26 [Man. R. M. 388, Ill. Fl. **1**: 306].

Mountain peaks at an altitude of 2500 m. and more.

MONTANA: Yogo, 1886, *R. S. Williams, 644;* Little Belt Pass, 1896, *Rydberg, 3343.*

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 662.*

* **Carex Mertensii** Prescott; Bong. Veg. Sitcha, Mem. Acad. St. Petersb. VI., **2**: 168 [Bailey, Proc. Am. Acad. **22**: 77].

Resembling somewhat *C. alpina*, but with spikes almost twice as large. At an altitude of 2500 m.

MONTANA: Upper Marias Pass, 1883, *Canby, 349.*

Carex atrata L. Sp. Pl. 976 [Man. R. M. 388; Bot. Cal. **2**: 239].

In mountain meadows at an altitude of 2500–3000 m.

MONTANA: Indian Creek, July 22, 1897, *Rydberg & Bessey, 3765;* Gallatin Co., 1886, *Tweedy, 1042;* Park Co., 1887, *13;* Yogo, 1888, *R. S. Williams, 449;* Beaver Creek, 1883, *Scribner, 320;* Yogo Baldy, 1896, *Rydberg, 3416;* Long Baldy, *3393;* Little Belt Pass, *3339.*

YELLOWSTONE PARK: 1885, *Tweedy, 653.*

The following specimens have been referred doubtfully to this species by Professor Bailey.

MONTANA: Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 3764.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 3767.*

Carex atratiformis Britton, Bull. Torr. Bot. Club, **22**: 222 [Ill. Fl. **1**: 306]; *Carex atrata ovata* Boott, Ill. 114 [Man. R. M. 388].

MONTANA: Haystack Peak, 1887, *Tweedy, 12.*

* **Carex trichocarpa laeviconica** (Dewey) Hitchc. Trans. Acad. Sci. St. Louis **5**: 524; *Carex trichocarpa Deweyi* Bailey, Bot. Gaz. **10**: 293; *Carex laeviconica* Dewey, Am. Journ. Sc. **24**: 47.

MONTANA: Yellowstone River, *Hayden* (according to Bailey, Proc. Am. Acad. **22**: 75).

Carex aristata R. Br. Frank. Journ. 751 [Ill. Fl. **1**: 302]; *Carex trichocarpa aristata* Bailey, Coult. Bot. Gaz. **10**: 294 [Man. R. M. 381].

Common in wet meadows and swamps up to an altitude of 2000 m.

MONTANA: Dillon, 1895, *Rydberg, 2086;* Deer Lodge, *2120;* Helena, *2146;* Bozeman, 1886, *Tweedy, 1039;* Great Falls, 1888, *R.*

S. Williams, *459;* Sixteen Mile Creek, 1883, *Scribner*, *324;* East Gallatin Swamp, 1896, *Rydberg*, *3203*.

Carex Raynoldsii Dewey, Am. Journ. Sc. II., **32**: 39 [Man. R. M. 387].

Common in the mountain regions at an altitude of 1500–3000 m.

MONTANA: Mystic Lake, 1895, *Shear*, *497: Rydberg*. *2254;* Bridger Mts., June 17, 1897, *Rydberg & Bessey*, *3757;* Spanish Basin, July 1, *3758:* Park Co., 1887, *Tweedy*, *14;* Highwood Mountains, 1888, *R. S. Williams*, *447;* Nevada Creek, 1883, *Canby*, *351:* Bozeman Pass, *351:* Upper Marias Pass, *351:* Bridger Cañon, 1896, *Flodman*, *274; Rydberg*, *3220:* Sheep Creek, *3317;* Yogo Baldy, *3424;* Little Belt Pass, *3327*.

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey*, *3759;* Upper Falls, Aug. 14, *3760:* East De Lacy's Creek, Aug. 10, *3761;* 1873, *C. C. Parry*, 277: 1884, *Tweedy*, *213;* 1885, *658;* 1884, *219;* Yellowstone Lake, 1871, *Hayden*.

Carex Parryana Dew. Am. Journ. Sc. **27**: 239 [Man. R. M. 387].

Rare within the state.

MONTANA: Upper Arrow Creek, 1886, *R. S. Williams*, *451*.

* **Carex Parryana Hallii**; *Carex Hallii* Olney, Hayden's Rep. **1871**: 496; *Carex Parryana unica* Bailey, Mem. Torr. Bot. Club, **1**: 54. 1889.

It has generally only one spike. Meadows at an altitude of 2500 m.

MONTANA: Deer Lodge, July 9, 1895, *Rydberg*, *2128;* Forks of the Madison, July 26, 1897, *Rydberg & Bessey*, *3762;* Spanish Basin, June 28, *3813*.

Carex Tolmiei Boott: Hook. Fl. Bor. Am. 2: 224 [Bailey; Proc. Am. Acad. **22**: 79, and Mem. Torr. Bot. Club, **1**: 46]; *Carex vulgaris alpina* Bailey; Coulter, Man. R. M. 386, in part, not Boott.

On high mountains at an altitude of about 3000 m.

MONTANA: Gallatin Peak, 1886, *Tweedy*, *1035;* Mill Creek, 1887, *20*.

***Carex Tolmiei subsessilis** Bailey, Mem. Torr. Bot. Club, **1**: 47.

At an altitude of about 3000 m.

MONTANA: Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey*, *3763*.

* **Carex Tolmiei nigella** Bailey, Mem. Torr. Bot. Club, **1**: 47; *Carex nigella* Boott; Hook. Fl. Bor. Am. **2**: 225.

MONTANA: Spanish Peaks, 1896, *Rydberg, 3065; Flodman, 282.*

* **Carex Montanensis** Bailey; Bot. Gaz. **17**; 152.

Near relative of *C. Tolmiei* with the habit of *C. Magellanica*, growing in clumps; culm weak and nodding, with soft, flat narrow leaves.

MONTANA: Upper Marias Pass, 1883, *Canby, 350.*

Carex Goodenovii Gay, Ann. Sci. Nat. II. **11**: 191 [Ill. Fl. **1**: 309]; *Carex vulgaris* Fries, Mant. **3**: 155 [Man. R. M. 386].

In the mountains at an altitude of 2500 m.

MONTANA: Mill Creek, 1887, *Tweedy, 16* and *17.*

Carex juncella Fries, Bot. Not. **1857**: 207; *Carex Kelloggii* Boott; S. Wats. Bot. Cal. **2**: 240, 1880; *Carex vulgaris juncella* Fries, Summa, 230. 1845 [Man. R. M. 386].

At an altitude of about 2000 m.

MONTANA: Neihart, *R. S. Williams, 791.*

Carex Bigelovii Torr.; Schw. Ann. Lyc. N. Y. **2**: 67 [Ill. Fl. **1**: 310]; *Carex hyperborea* Drej. Rev. Crit. Car. 43; *C. vulgaris hyperborea* Boott, Ill. 167 [Man. R. M. 386].

MONTANA: Belt Park, 1886, *R. S. Williams, 450.*

Carex rigida Good. Trans. Linn. Soc. **2**: 193; *Carex vulgaris alpina* Boott, Ill. **4**: 167 [Man. R. M. 386; Bot. Cal. **2**: 241].

High mountain peaks at an altitude of 2500–3000 m.

MONTANA: Yogo Baldy, 1896, *Rydberg, 3414;* Little Belt Pass, *3341.*

* **Carex nudata** Boott; Wats. Bot. Cal. **2**: 241.

It is distinguished from *C. Goodenovii* by the fimbriate sheaths and deciduous perigynia. On mountain tops at an altitude of 2500–3000 m.

MONTANA: Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey, 3755.*

YELLOWSTONE PARK: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey.*

Carex Nebraskensis Dewey, Am. Journ. Sci. II., **18**: 102 [Ill. Fl. **1**: 308]; *Carex Jamesii Nebraskensis* Bailey, Carex Cat. Suppl. [Man. R. M. 384].

Common in wet meadows up to an altitude of 2500 m.

MONTANA: Bozeman, 1895, *Shear, 461½*; Forks of the Madison, July 26, 1897; *Rydberg & Bessey, 3740;* Bridger Mts., June 14, *3768;* Box Elder Creek, 1886, *R. S. Williams, 461a;* Spanish Basin, 1896, *Rydberg, 3125;* East Gallatin Swamps, *3196:* Elk Mts., Black Hawk, *3278.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 3744* and *3749.*

Carex Nebraskensis praevia Bailey, Mem. Torr. Bot. Club, **1**: 49; *Carex Jamesii* Torr. Ann. Lyc. N. Y. **3**: 398; not Schwein. [Man. R. M. 384; Bot. Cal. **2**: 243].

With the preceding.

MONTANA: Spanish Basin, July 1, 1897, *Rydberg & Bessey, 3748;* Bozeman, 1887, *Tweedy, 15;* Mt. Blackmore, 1886, *1037;* Wolf Butte, 1888, *R. S. Williams 461;* Jefferson City, 1883, *Scribner, 319.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 286.*

Carex variabilis Bailey, Mem. Torr. Bot. Club. **1**: 18; *Carex stricta* and *C. aperta divaricata* Bailey, in Coulter, Man. R. M. 385.

Common in wet meadows up to an altitude of 2500 m.

MONTANA: Bozeman, 1895, *Shear, 448* (?), *461:* Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 3750, 3754.*

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3751* (?), *3753:* Yellowstone Falls, Aug. 14, *3814; Letterman.*

Carex variabilis altior; *Carex variabilis elatior* Bailey, Mem. Torr. Bot. Club, **1**: 19, 1889; not *C. elatior* Boeckl. 1880.

Taller, with long and narrower leaves.

MONTANA: Mystic Lake, 1895, *Shear, 479: Rydberg, 2238, 2256.*

* **Carex acutina** Bailey, Mem. Torr. Bot. Club, **1**: 52: *Carex acuta* Bailey, Proc. Am. Acad. **22**: 86; not Linn.

YELLOWSTONE PARK: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey, 3752:* Black Tail Deer Creek, 1884, *Tweedy, 212, 216.*

Carex Idahoa Bailey, Bot. Gaz. **21**: 5. 1896.

This species has not been collected in Montana, but may be expected to occur there, as the type was collected very near the state boundary in Idaho at Beaver Cañon, 1895, *Rydberg, 2339.*

Carex ablata Bailey, Bot. Gaz. **13**: 82; *Carex frigida* Bailey, in Coulter, Man. R. M. 380; not All.

Meadows at an altitude of about 2500 m.

Yellowstone Park: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3756.*

Caxex longirostris Torr.: Schw. Ann. Lyc. N. Y. **1**: 71 [Ill. Fl. **1**: 319]; Man. R. M. 380.

Among bushes up to an altitude of 2000 m.

Montana: Park Co., 1889, *Tweedy;* Gallatin Co., 1886, *1033;* Tiger Butte, 1886, *R. S. Williams, 473;* Jefferson City, 1882, *Scribner, 326.*

Yellowstone Park: Mammoth Hot Springs and East Fork, 1885, *Tweedy, 661.*

Carex capillaris L. Sp. Pl. 977 [Man. R. M. 380; Ill. Fl. **1**: 320].

On the mountains at an altitude of 2400 m. or more.

Montana: Yogo, 1888, *R. S. Williams, 642;* Upper Marias Pass, 1883, *Canby, 352.*

Carex flava L. Sp. Pl. 975 [Man. R. M. 381: Ill. Fl. **1**: 323].

In sandy meadows.

Montana: St. Ignatius Mission, 1883, *Canby, 353.*

* **Carex flava recterostrata** Bailey, Bot. Gaz. **13**: 84.

Wet sandy meadows to an altitude of 2500 m.

Montana: Logging Creek, 1889, *R. S. Williams, 834.*

Yellowstone Park: Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 3781.*

* **Carex viridula** Michx. Fl. Bor. Am. **2**: 170 [Ill. Fl. **1**: 324]; *Carex flava viridula* Bailey, Mem. Torr. Bot. Club, **1**: 31.

In wet places up to an altitude of 1500 m.

Montana: Sun River Cañon, 1887, *R. S. Williams, 643.*

Carex abbreviata Prescott; Boott, Trans. Linn. Soc. **20**: 141 [Ill. Fl. **1**: 324]: *Carex Torreyi*, Tuck. Enum. Meth. 21 [Man. R. M. 378]; not *C. Torreyana* Schw.

Montana: Highwood Cañon, 1889, *R. S. Williams, 795.*

Carex aurea Nutt. Gen. **2**: 205 [Man. R. M. 378; Ill. Fl. **1**: 331; Bot. Cal. **2**: 240].

In wet meadows up to an altitude of 2500 m.

Montana: Manhattan, 1895, *Rydberg, 2205;* Mystic Lake, *2240;*

Spanish Basin, June 28 and July 1, 1897, *Rydberg & Bessey*, *3774*, *3775*; Belt River Cañon, 1886, *R. S. Williams*, *445*; West Gallatin, 1883, *Scribner*, *321*: Spanish Basin, 1896, *Rydberg*, *3107*.

YELLOWSTONE PARK: 1886, *Tweedy*, *45*.

Carex concinna R. Br. Frankl. Journ. 763 [Man. R. M. 376; Ill. Fl. 1: 332].

In wet places among rocks up to an altitude of 2500 m.

MONTANA: Sun River, 1887, *R. S. Williams*, *649*.

YELLOWSTONE LAKE: 1885, *Tweedy*, *655*.

* Carex pseudoscirpoidea.

Dioecious, growing in large clumps: leaves mostly basal; the earliest reduced to brown scales, the rest 1–2 dm. long and fully 3 mm. wide, somewhat carinate, strongly veined, scabrous, especially on the margins, long-acuminate; culm 1–3 dm. high, seldom higher, sharply 3-angled, striate, scabrous, generally over 1 mm. in diameter; fertile spike oblong-cylindric, 1–2.5 cm. long, in fruit fully 5 mm. in diameter, subtended a short distance below by a lanceolate-subulate bract, which is green with dark brown margins; scales broadly ovate, dark brownish purple, with a thin erose margin, fully equalling the perigynia; these 3 mm. long, bluntly triangular, obovate, slightly beaked, greenish, and densely hirsute; styles 3; sterile spike oblanceolate-club-shaped, about 2 dm. long and 5–7 mm. in its greatest diameter; scales similar, but somewhat lighter in color; anthers linear, about 3 mm. long.

This has been confounded with the eastern *C. scirpoidea* Michx., which is a much more slender plant, the leaves seldom over 2 mm. wide, the culm less than 1 mm. in diameter, the fertile spike in fruit seldom over 3 mm. in diameter, and the scales shorter than the fully developed perigynia and generally with a greenish midrib.

C. scirpoidea ranges from the mountains of New England to Greenland and throughout subarctic America to Behring Strait, while in the Rockies its place is taken by *C. pseudoscirpoidea*, extending from southern Alaska to Wyoming and Utah. The Californian plant may be still different. The following specimens belong here:

MONTANA: Lone Mountain, Gallatin Co., 1886, *Tweedy*, *1043*: Boulder Creek (altitude 2800 m.), 1887, *45*: Yogo, 1888, *R. S. Williams*, *464*; Little Belt Pass, 1896, *Rydberg*, *3314*: Spanish Basin, *3064*; Yogo Baldy, *3412*: Tiger Butte, 1883, *Scribner*, *306*.

YELLOWSTONE PARK: 1885 (altitude 3000 m.), *Tweedy*, *659*.

Carex Pennsylvanica Lam. Enc. **3**: 388 [Man. R. M. 374; Ill. Fl. **1**: 333; Bot. Cal. **2**: 246].

On prairies up to an altitude of a little over 1000 m.

MONTANA: Box Elder Creek, 1886, *R. S. Williams, 462.*

Carex filifolia Nutt. Gen. **2**: 204 [Man. R. M. 374; Ill. Fl. **1**: 339: Bot. Cal. **2**: 229].

On dry plains up to an altitude of 2000 m.

MONTANA: Great Falls, 1886, *R. S. Williams, 470;* Shields River, 1883, *Scribner, 308* (gravelly soil): Cottonwood Creek, 1896, *Rydberg, 3312;* Spanish Basin, *3067.*

* **Carex deflexa** Hornem. Plantel. Ed. 3, **1**: 938 [Ill. Fl. **1**: 334].

In open places up to an altitude of 2000 m.

MONTANA: Armington, 1892, *R. S. Williams, 796.*

* **Carex deflexa Farwellii** Britton, Ill. Fl. **1**: 334: *Carex deflexa media* Bailey, Mem. Torr. Bot. Club, **1**: 43; not *C. media* R. Br.

On mountains up to an altitude of 2500 m.

MONTANA: Long Baldy, Little Belt Mts., 1896, *Flodman, 288: Rydberg, 3392;* Little Belt Mts., *3377.*

Carex deflexa Rossii Bailey, Mem. Torr. Bot. Club, **1**: 43; *Carex Rossii* Boott: Hook. Fl. Bor. Am. **2**: 222: *C. Novae-angliae Rossii* Bailey, Bot. Gaz. **10**: 207 [Man. R. M. 375].

MONTANA: Park Co., 1887, *Tweedy, 41:* Highwood Mts., 1888, *R. S. Williams, 793.*

YELLOWSTONE PARK: Mirror Lake, 1885, *Tweedy, 657.*

Carex durifolia Bailey, Bull. Torr. Bot. Club, **10**: 428 [Ill. Fl. **1**: 338]: *Carex Backii* Boott; Hook. Fl. Am. **2**: 210 [Man. R. M. 376]; not *C. Backiana* Dewey.

In woods up to an altitude of 2200 m.

MONTANA: Sand Coulee, 1891, *R. S. Williams, 794;* Trail Creek, 1887; *Tweedy.*

Carex obtusata Lilj. Vet. Akad. Nya. Handl. **1793**: 69 [Man. R. M. 377].

On high mountains and table lands up to an altitude of 3000 m.

MONTANA: Bridger Mts., June 11, 1897, *Rydberg & Bessey, 3773;* Belt Cañon, 1887, *R. S. Williams, 641;* Little Belt Mts., 1883, *Scribner, 309:* Long Baldy, Little Belt Mts., 1896, *Rydberg, 3385; Flodman, 292.*

Carex leptalea Wahl. Kong. Vet. Acad. Hand. II., **24**: 139 [Ill. Fl. **1**: 339]; *Carex polytrichoides* Willd.: Wahl. l. c. [Man. R. M. 378].

In bogs.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 952.*

Carex Hoodii Boott; Hook. Fl. Bor. Am. **2**: 211 [Bot. Cal. **2**: 231]: *Carex muricata confixa* Bailey, Bot. Gaz. **10**: 203 [Man. R. M. 390].

In wet places in the mountains, up to an altitude of 2000 m.

MONTANA: Spanish Basin, 1896, *Rydberg, 3034:* Bozeman, *3007;* Mystic Lake, 1895, *Shear, 486;* Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 3794;* Spanish Basin, June 28, *3792;* Highwood Mountains, 1888, *R. S. Williams, 833;* Park Co., 1877, *Tweedy, 51;* Flathead River, 1883, *H. B. Ayers, LXXXI;* Bridger Cañon, 1896, *Rydberg, 3207* and *3221;* Little Belt Pass, *3325.*

YELLOWSTONE PARK: 1873, *C. C. Parry,* 281: 1888, *Charles H. Hall,* 1885, *Tweedy, 651.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 3799.*

Carex Geyeri Boott, Trans. Linn. Soc. **10**: 118 [Man. R. M. 376; Bot. Cal. **2**: 229].

On high mountains up to an altitude of 3000 m.

MONTANA: Bridger Mts., June 18, 1897, *Rydberg & Bessey, 3771;* 1896, *Flodman, 290:* Park Co., 1887, *Tweedy, 42:* Belt Mountains, 1888, *R. S. Williams, 472:* McDonald's Peak, 1883, *Canby, 344;* Bozeman Pass, 1883, *Scribner, 307;* Big Hole Valley, 1880, *Watson;* Bridger Cañon, 1886, *Rydberg, 3092;* Little Belt Pass, *3321;* Elk Mountains, Black Hawk, *3292;* Spanish Basin, *3035.*

YELLOWSTONE PARK: East DeLacy's Creek, July 10, 1897, *Rydberg & Bessey, 3769:* 1885, *Tweedy, 656:* 1888, *Dr. Chas. H. Hall.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 3770* and *3772.*

Carex Pyrenaica Wahl. Vet. Akad. Nya. Handl. **1803**: 129 [Man. R. M. 373; Bot. Cal. **2**: 228].

On mountain tops up to an altitude of 3300 m.

MONTANA: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 3766;* Columbia Falls, 1892, *R. S. Williams, 954.*

Carex nigricans C. A. Mey. Mem. Sav. Etr. Peters. **1**: 210 [Man. R. M. 373].

High mountains up to an altitude of 3000 m.

Montana: Gallatin Peak, 1886, *Tweedy*, *1038*; Boulder Creek, 1887, *44*.

Carex stenophylla Wahl. Kongl. Vet. Acad. Nya Handl. **24**: 142 [Man. R. M. 391; Ill. Fl. **1**: 341].

On dry plains and table lands up to an altitude of 2000 m.

Montana: Lima, 1895, *Shear*, *324*; *Rydberg*, *2071*; Townsend, *2169½*; Great Falls, 1892; *R. S. Williams*, *463*; Deer Lodge, 1892, *W. T. Shaw*; Shields River Basin, 1896, *Rydberg*, *3227*.

Carex stipata Muhl.; Willd. Sp. Pl. **4**: 233 [Man. R. M. 391; Ill. Fl. **1**: 343; Bot. Cal. **2**: 233].

In swamps up to an altitude of 1800 m.

Montana: Bozeman, 1896, *Rydberg*, *3001*; *Flodman*, *294*.

* **Carex Jonesii** Bailey, Mem. Torr. Bot. Club, **1**: 16.

In wet places at an altitude of 2300 m.

Yellowstone Park: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey*, *3786*.

Carex Gayana Desv. in C. Gay, Fl. Chil. **4**: 205 [Man. R. M. 393; Bot. Cal. **2**: 231].

Montana: Shields River, 1888, *R. S. Williams*, *830*; Martindale, 1882, *Canby*; Crow Creek, 1883, *Scribner*, *312*; Boulder Creek, *313*.

Carex marcida Boott; Hook. Fl. Bor. Am. **2**: 212 [Man. R. M. 392; Ill. Fl. **1**: 344; Bot. Cal. **2**: 231].

Dry prairies up to an altitude of 2000 m.

Montana: Silver Bow, July, 1895; *Shear*, *355*; Bozeman, *459*; Lima, Aug. 5, *571*; Forks of the Madison, July 26, 1897, *Rydberg & Bessey*, *3802* and *3803* (?); Sun River, 1887, *R. S. Williams*, *457*; Grasshopper Valley, *Watson*, *1880*; Spanish Basin, 1896, *Rydberg*, *3163*.

Yellowstone Park: Mammoth Hot Springs, 1885, *Tweedy*, *651*.

* **Carex teretiuscula** Good. Trans. Linn. Soc. **2**: 163 [Ill. Fl. **1**: 344].

Wet meadows at an altitude of less than 1000 m.

Montana: Sun River, 1887, *R. S. Williams*, *645*.

Carex Sartwellii Dewey. Am. Journ. Sci. **43**: 90 [Ill. Fl. **1**: 346]; *Carex disticha* Sartw.: Boott, Ill. *t. 410* [Man. R. M. 392: Bot. Cal. **2**: 230].

Wet meadows and swamps up to an altitude of 2000 m.

MONTANA: Sun River Cañon, 1887, *R. S. Williams, 648:* Smiths River, 1883, *Scribner, 311:* Spanish Basin, 1896, *Rydberg, 3108, 3127.*

Carex Douglasii Boott; Hook. Fl. Bor. Am. **2**: 213 [Man. R. M. 293: Ill. Fl. **1**: 342; Bot. Cal. **2**: 231].

Dry prairies up to an altitude of a little over 2000 m.

MONTANA: Logan, 1895, *Shear, 502:* Gallatin, *529:* Big Hole River, 1888, *Tweedy, 43:* Deer Lodge, 1888, *F. W. Traphagen;* Madison Co., 1886, *Tweedy, 1036;* Great Falls, 1887, *R. S. Williams, 465;* 1887, *F. W. Anderson;* Bozeman, 1883, *Scribner, 310;* Nevada Creek, 1883, *Canby, 345.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 283.*

* **Carex Douglasii Williamsii**; *Carex Douglasii laxiflora* Bailey, Mem. Torr. Bot. Club, **1**: 21: not *C. laxiflora* Lam.

MONTANA: Utica, 1888, *R. S. Williams.*

Carex tenella Schk. Riedgr. 23 [Man. R. M. 389: Ill. Fl. **1**: 346; Bot. Cal. **2**: 235].

Boggy places in the woods up to an altitude of 2000 m.

MONTANA: Silver Bow, 1895, *Shear, 354: Rydberg, 2105;* Spanish Basin, June 30, 1897, *Rydberg & Bessey, 3776:* Lewis and Clarke Co., *Mrs. Estella Muth;* Park Co., 1887, *Tweedy, 59;* Belt River, 1889, *R. S. Williams, 467:* Helena, 1889, *Kelsey:* Jefferson City, 1883, *Scribner, 317:* Spanish Basin, 1896, *Flodman, 316: Rydberg, 3032* and *3144;* Sheep Creek, *3299.*

Carex occidentalis Bailey, Mem. Torr. Bot. Club, **1**: 14: *Carex muricata Americana* Bailey, Proc. Am. Acad. **22**: 140; *Carex muricata* Olney, Bot. King's Exp. **5**: 362 [Man. R. M. 390].

MONTANA: Boulder Creek, 1887, *Tweedy, 60.*

Carex cephaloidea Boott, Ill. **3**: 123 [Man. R. M. 390; Ill. Fl. **1**: 348].

Hillsides at an altitude of 1600 m.

MONTANA: Bozeman, 1896, *Rydberg, 3002.*

Carex nardina Fries, Mant. **2**: 55 [Man. R. M. 389: Ill. Fl. **1**: 340].

MONTANA: Upper Marias Pass, 1883, *Canby, 343*.

Carex Redowskyana Meyer; Mem. Sav. Etr. Peters. **1**: 207 [Ill. Fl. **1**: 340]; *Carex gynocrates* Wormskj.; Drejer, Rev. Crit. Car. 16 [Man. R. M. 389].

MONTANA: Moose Creek, 1887, *R. S. Williams, 646*.

Carex sterilis angustata (Carey) Bailey, Bull. Torr. Bot. Club, **20**: 425; *Carex echinata angustata* Carey; Gray, Man. 544: *C. echinata microcarpa* Bailey, in Coulter Man. R. M. 395.

In moist ground.

MONTANA: Logging Creek, 1888, *R. S. Williams, 471*.

***Carex interior** Bailey, Bull. Torr. Bot. Club, **20**: 426 [Ill. Fl. **1**: 350].

Differs from *C. sterilis* in its shorter, short-beaked and weaker-nerved perigynia.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey, 3779*.

Carex canescens L. Sp. Pl. 974 [Man. R. M. 394; Ill. Fl. **1**: 351; Bot. Cal. **2**: 236].

In mountain meadows up to an altitude of 2500 m.

MONTANA: Mystic Lake, 1895, *Shear, 480; Rydberg, 2235;* Park Co., 1887, *Tweedy;* Neihart, 1888, *R. S. Williams, 792;* Spanish Basin, 1896, *Rydberg, 3077, 3145: Flodman, 320*.

YELLOWSTONE PARK: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey, 3777;* Lower Geyser Basin, Aug. 4, *3778;* 1884, *Tweedy, 218*.

Carex brunescens (Pers.) Poir. in Lam. Enc. Suppl. **3**: 286 [Ill. Fl. **1**: 351]; *Carex curta brunnescens* Pers. Syn. **2**: 539: *Carex canescens alpicola* Wahl. Fl. Lapp. 286 [Man. R. M. 394].

In mountain meadows up to an altitude of 2000 m.

MONTANA: Mystic Lake, 1895, *Rydberg, 2239;* Grasshopper Valley, *Watson, 1880;* Loto Creek, 1880, *Watson*.

Carex Deweyana Schw. Ann. Lyc. N. Y. **1**: 65 [Man. R. M. 394; Ill. Fl. **1**: 354; Bot. Cal. **2**: 236].

In woods up to an altitude of 2000 m.

MONTANA: Clendenin, 1889, *R. S. Williams, 466;* Dutchman's Creek, Jefferson City, 1883, *Scribner, 322*.

Carex Liddoni Boott; Hook. Fl. Bor. Am. **2**: 214 [Man. R. M. 397].

In mountain meadows at an altitude of 1500–2500 m.

MONTANA: Spanish Basin, July 23 and 26, 1897, *Rydberg & Bessey, 3804* and *3805:* Bridger Mts., June 11–14; *3807* and *3808:* Trail Creek, 1887, *Tweedy:* Sixteen Mile Creek, 1883, *Scribner, 318:* Spanish Basin, 1896, *Rydberg, 3140* and *3051½; Flodman, 309.*

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 652.*

Carex praticola; *Carex pratensis* Drejer, Rev. Crit. Car. 24: not Hose, 1797; [Ill. Fl. **1**: 354]; *Carex adusta minor* Boott, Ill. 119 [Man. R. M. 397].

Mountain meadows at an altitude of 1500–2500 m.

MONTANA: Mystic Lake, 1895, *Rydberg, 2251:* Spanish Basin, June 28, 1897, *Rydberg & Bessey, 3806:* Whitefish River, 1892, *R. S. Williams, 945;* Spanish Creek, 1896, *Rydberg, 3086: 3051.*

YELLOWSTONE PARK: Yellowstone Falls, *Letterman.*

Carex tribuloides Wahl. Vet. Akad. Nya Handl. **24**: 145 [Ill. Fl. **1**: 356]: *Carex lagopodioides* Schkur, Riedgr. Nacht. 20 [Man. R. M. 396].

In meadows at an altitude of about 1500 m.

MONTANA: Bozeman, 1896, *Rydberg, 3004.*

Carex straminea Willd.; Schk. Riedgr. 49 [Man. R. M. 397; Ill. Fl. **1**: 358].

Dry meadows and prairies up to an altitude of 1500 m.

MONTANA: Manhattan, 1895, *Rydberg, 2187*; Great Falls, 1888, *R. S. Williams, 458:* Mission Range, 1883, *Canby, 347:* Castle, 1896, *Rydberg, 3239* (?).

* **Carex foenea** Willd. Enum. 957 [Ill. Fl. **1**: 357].

Dry valleys at an altitude of 2000 m.

MONTANA: Spanish Basin, 1896, *Rydberg, 3148* (?).

Carex Preslii Steud. Syn. Pl. Cyp. 243; *Carex leporina* Presl, Reliq. Haenk. 204 [Man. R. M. 396; Ill. Fl. **1**: 356]; not L.

On the higher mountains at an altitude of 2500–3500 m.

MONTANA: Old Hollowtop, July 7, 1897, *Rydberg & Bessey, 3783:* Yogo, 1888, *R. S. Williams, 647:* East Boulder, 1887, *Tweedy, 14;* McDonald's Peak, 1883, *Canby, 346:* Upper Marias Pass, *Canby.*

YELLOWSTONE PARK: Stinking Water, 1873, *Parry*, *287*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *3782*.

Carex tenuirostris Olney, Am. Natur. 8: 214; *Carex Bonplandii* Bailey, Proc. Am. Acad. **24**: 152 (not Kunth) and var. *angustifolia* in Coulter, Man. R. M. 395 in part.

Mountain meadows at an altitude of about 2500 m.

MONTANA: Little Belt Mountains, 1896, *Rydberg*, *3397*.

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey*, *3809*; 1873, *C. C. Parry*, *284*.

Carex festiva Dewey Am. Journ. Sci. **29**: 246 [Man. R. M. 395; Bot. Cal. **2**: 234].

In wet meadows at an altitude of 1500–3000 m.

MONTANA: Lima, 1895, *Rydberg*, *2073*: Mystic Lake, *2252*; Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey*, *3784*; Cliff Lake, July 27, *3796*: Spanish Basin, July 1, *3797*: Bridger Mts., June 14, *3793*: East Boulder, 1887, *Tweedy*, *49*: West Boulder, 1887, *48* and *50*: Hell Roaring Creek, *46*: Yogo, 1888, *R. S. Williams*, *454*: Bozeman, *Scribner*, *316*: West Gallatin, *314*: Belt Pass, 1896, *Rydberg*, *3341*.

YELLOWSTONE PARK: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey*, *3800*: Electric Peak, Aug. 18, *3801*: Swan Lake, 1888, *H. Knowlton*: Yellowstone Lake, 1885, *Tweedy*, *650*: 1873, *C. C. Parry*, *282*.

***Carex festiva stricta** Bailey, Mem. Torr. Bot. Club, **1**: 51. 1889.

This and the two following should receive new names as the varietal names are antedated by similar ones used as specific elsewhere in the genus. The species needs, however, a thorough revision and in my opinion several species are included in it. It is therefore best perhaps to leave the names as they are until someone undertakes to study the plants critically. Most of the specimens cited below have been determined by Professor Bailey.

MONTANA: Lima, Aug. 5, 1895, *Shear*, *572½*.

* **Carex festiva viridis** Bailey, Mem. Torr. Bot. Club, **1**: 51.

MONTANA: Sixteen Mile Creek, 1883, *Scribner*, *315*; Park Co., *Tweedy*.

Carex festiva Haydeniana Boott, Bot. Cal. **2**: 234 [Man. R. M. 396].

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg &*

Bessey, 3811; East DeLacy's Creek. Aug. 10, *3787:* 1884, *Tweedy, 220;* Falls of Yellowstone, 1871, *Hayden.*

***Carex festiva pachystachya** (Cham.) Bailey, Mem. Torr. Bot. Club, 1: 51; *Carex pachystachya* Cham.; Steud. Pl. Cyp. 197.

MONTANA: Park Co., *Tweedy* (acc. to Bailey).

Carex festiva Dewey, var.

The following specimens were designated thus by Professor Bailey. They represent several forms of the *festiva* group, perhaps even several distinct species.

MONTANA: July 17, 1895, *Rydberg, 2186;* Spanish Basin, June 28 and July 1, 1897, *Rydberg & Bessey, 3788, 3789:* Spanish Basin, 1896, *Rydberg, 3033* (?).

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3791:* Yellowstone Lake, Aug. 12, *3810:* Upper Falls, Aug. 14, *3785.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 3790, 3812.*

Carex athrostachya Olney, Proc. Am. Acad. 8: 393 [Man. R. M. 396; Bot. Cal. 2: 234].

In meadows up to an altitude of an altitude of 2000 m.

MONTANA: Bozeman, 1895, *Shear, 455; Rydberg, 2216;* Box Elder Creek, 1886, *R. S. Williams, 453;* Flathead River, 1883, *Canby, 348:* Spanish Basin, 1896, *Rydberg, 3041, 3056.*

* **Carex sychnocephala** Carey, Am. Journ. Sci. II., 4: 24 [Ill. Fl. 1: 360].

Prairies at an altitude of less than 1000 m.

MONTANA: Great Falls, 1891, *R. S. Williams, 474.*

ARACEAE.

* **Lysichiton Kamtschatcensis** Schott, Prod. Aroid. 412 [Bot. Cal. 2: 187].

The only Araceous plant of the region, somewhat resembling the Skunk Cabbage of the East. Its leaves are oblong-lanceolate, 3–7 dm. long and 8–25 cm. wide; the peduncle is very stout, with a broad, acute spathe. It is confined to the portion of the State west of the Rockies.

MONTANA: Hudson Bay Creek, Flathead Lake, 1883, *Canby, 334.*

LEMNACEAE.

Lemna trisulca L. Sp. Pl. 370 [Man. R. M. 360; Ill. Fl. **1**: 366; Bot. Cal. **2**: 189].

In shallow water up to an altitude of 2500 m.

MONTANA: Great Falls, 1886, *R. S. Williams, 539.*

YELLOWSTONE PARK: 1871, *Robert Adams* (Hayden Surv.); 1887, *Knowlton*; Yellowstone Lake, 1871, *Hayden*; 1872, *Coulter.*

Lemna minor L. Sp. Pl. 970 [Man. R. M. 360; Ill. Fl. **1**: 366; Bot. Cal. **2**: 190].

In stagnant water up to an altitude of 2000 m.

MONTANA: Helena, 1892, *Kelsey.*

* **Lemna cyclostasa** (Ell.) Chev. Fl. Par. **2**: 256: *Lemna minor cyclostasa* Ell. Bot. S. Ca. & Ga. **2**: 518; *L. Valdiviana* Phil. Linnaea, **33**: 239.

Differs from *L. minor* in the lack of lateral veins on the fronds, which are smaller, and in the orthotropous ovules. In stagnant water.

YELLOWSTONE PARK: Indian Creek, 1884, *Tweedy, 56.*

* **Lemna gibba** L. Sp. Pl. 790 [Ill. Fl. **1**: 367; Bot. Cal. **2**: 190].

Differs from *L. minor* by the fronds which are spongy gibbous beneath. It grows in ponds and slow streams up to an altitude of 2500 m.

YELLOWSTONE PARK: Broad Creek, 1885, *Tweedy, 410.*

COMMELINACEAE.

* **Tradescantia occidentalis** Britton; *Tradescantia Virginiana occidentalis* Britton, Ill. Fl. **1**: 377.

It differs from the eastern *T. Virginica* in the longer and narrower leaves and the smaller flowers. It grows in sandy soil in the prairie and plain regions, reaching an altitude of 1200 m.

MONTANA: Big Horn River, 1891, *Tweedy.*

JUNCACEAE.

Juncus Balticus Willd. Berlin Mag. **3**: 298 [Man. R. M. 357; Ill. Fl. **1**: 384; Bot. Cal. **2**: 205].

In meadows, especially in alkaline soil, up to an altitude of 2500 m.

MONTANA: Lima, 1895, *Rydberg, 2072* and *2308;* Deer Lodge, *2131;* Melrose, *Shear, 345;* Forks of Madison, July 26, 1897, *Ryd-*

berg & Bessey, 3841: East Gallatin Swamps, 1896, *Flodman, 326;* Spanish Basin, *325;* Great Falls, 1886, *R. S. Williams, 303;* East Gallatin Swamps, 1896, *Rydberg, 3189:* Elk Mountains, *3240.*

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 671.*

Juncus filiformis L. Sp. Pl. 326 [Man. R. M. 357; Ill. Fl. **1**: 383].

In wet places up to an altitude of 2500 m.

MONTANA: Lake Terry, 1892, *R. S. Williams, 911.*

YELLOWSTONE PARK: Turbid Lake, 1885, *Tweedy. 668.*

Juncus subtriflorus (E. Mey.) Coville, Cont. U. S. Nat. Herb. **4**: 208; *Juncus compressus subtriflorus* Mey. Linnaea, **3**: 368; *J. Drummondii* Mey.; Ledeb. Fl. Ross, **4**: 235 [Man. R. M. 357; Bot. Cal. **2**: 206].

On mountain tops at an altitude of 2500–3500 m.

MONTANA: Little Belt Pass, 1896, *Flodman, 330:* Long Baldy, *329;* Mill Creek, Park Co., 1887, *Tweedy, 154:* Belt Park, 1886, *R. S. Williams, 513:* Little Belt Mountains, 1896, *Rydberg, 3336* and *3396.*

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 3816* and *3817:* East De Lacy's Creek, Aug. 10, *3819;* 1885, *Tweedy, 669.*

Juncus Parryi Engelm. Trans. Acad. Sc. St. Louis, **2**: 446 [Man. R. M. 357; Bot. Cal. **2**: 206].

High mountain tops at an altitude of 2500–3500 m.

MONTANA: Old Hollowtop, near Pony, July 7, 1897, *Rydberg & Bessey, 3818;* Long Baldy, Little Belt Mts., 1896, *Flodman, 328;* Yogo, 1888, *R. S. Williams, 510;* Park Co., 1887, *F. Tweedy, 153;* Little Belt Mts., 1896, *Rydberg, 3398* and *3401.*

YELLOWSTONE PARK: Upper Falls, *Adams* (Hayden Survey).

* **Juncus confusus** Coville, Proc. Biol. Soc. Wash. **10**: 127.

Resembles *J. tenuis*, but differs in the more contracted panicle, the shorter bract and the larger capsule. It is nearly as common and occurs in similar situations.

MONTANA: Spanish Basin, 1897, *Rydberg & Bessey, 3815:* Elk Mts., 1896, *Flodman, 334;* Spanish Basin, *335:* Bozeman, 1886, *Tweedy, 1046;* Horned Creek, 1883, *Scribner, 293;* Spanish Basin, 1896, *Rydberg, 3058, 3095,* and *3116;* Elk Mountains, *3282.*

YELLOWSTONE PARK: Yellowstone Lake, 1871, *Hayden.*

Juncus tenuis Willd. Sp. Pl. **2**: 214 [Man. R. M. 358: Ill. Fl. **1**: 386; Bot. Cal. **2**: 207].

Common in meadows up to an altitude of 2000 m.

MONTANA: Manhattan, *Shear, 441;* Bozeman, *Rydberg, 2211;* Logan, *Shear, 507;* Townsend, *Rydberg, 2149;* Spanish Basin, June 23, 1897, *Rydberg & Bessey, 3840:* Box Elder Creek, 1886, *R. S. Williams, 508;* Jefferson City, 1883, *Scribner, 295;* Missoula, 1880, *Watson.*

Juncus longistylis Torr. Bot. Mex. Bound. 223 [Man. R. M. 358; Ill. Fl. **1**: 388; Bot. Cal. **2**: 208].

In meadows up to an altitude of 2500 m.

MONTANA: Manhattan, 1895, *Shear, 420: Rydberg, 2172* and *2185;* Bozeman, *2212;* Silver Bow, July 8, *2107;* Forks of the Madison, July 26, 1897: *Rydberg & Bessey, 3822:* Spanish Basin, July 1, 1897, *3823:* 1896, *Flodman, 333:* Great Falls, 1887, *R. S. Williams, 514;* Bozeman, 1896, *Rydberg, 3003:* Spanish Basin, *3115.*

YELLOWSTONE PARK: 1885, *Tweedy, 670.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 3821.*

* **Juncus Regelii** Buchen. Engl. Bot. Jahrb. **12**: 414.

It is related to *J. marginatus* and *J. longistylis*, but is more delicate, has narrow leaves and smaller heads. In damp places on the mountain sides at an altitude of 2000–3000 m.

MONTANA: Mystic Lake, 1895, *Shear, 481; Rydberg, 2242:* Bridger Mountains, 1896, *Flodman, 331:* Spanish Basin, 1896, *Rydberg, 3136;* Bridger Mountains, *3211.*

Juncus bufonius L. Sp. Pl. 328 [Man. R. M. 358; Ill. Fl. **1**: 285; Bot. Cal. **2**: 206].

On river banks and in wet sandy soil up to an altitude of 2500 m.

MONTANA: Manhattan, 1895, *Rydberg, 2199; Shear, 438;* Fridley, 1887, *Tweedy, 155;* Deep Creek, 1891, *R. S. Williams, 297.*

YELLOWSTONE PARK: Upper Geyser Basin, Aug. 6, 1897, *Rydberg & Bessey, 3820;* Turbid Lake, 1885, *Tweedy, 672.*

Juncus Richardsonianus Schult.; R. & S. Syst. **7**: 201 [Ill. Fl. **1**: 391]; *Juncus alpinus insignis* Fries; Engelm. Trans. St. Louis Acad. **2**: 458 [Man. R. M. 358].

In mountain meadows.

MONTANA: Belt Creek, *R. S. Williams, 509.*

* **Juncus nodosus** L. Sp. Pl. Ed. 2, 466 [Ill. Fl. **1**: 392; Bot. Cal. **2**: 208].

It differs from the next in the smaller greener heads and erect, not divergent, leaves. On river banks up to an altitude of 1800 m.

MONTANA: Deer Lodge, 1895, *Rydberg, 2116;* Manhattan, *2207; Shear, 444;* Melrose, *Rydberg, 2272;* East Gallatin Swamps, 1896, *Flodman, 337;* Great Falls, 1886, *R. S. Williams, 507;* East Gallatin, 1896, *Rydberg, 3186.*

Juncus Torreyi Coville, Bull. Torr. Bot. Club, **22**: 303 [Ill. Fl. **1**: 392]: *Juncus nodosus megacephalus* Torr. Fl. N. Y. **2**: 326 [Man. R. M. 358: Bot. Cal. **2**: 208]: *Juncus megacephalus* Wood, Bot. Ed. 2, 724, 1861; not M. A. Curtis, 1835.

In or near water up to an altitude of 1500 m.

MONTANA: Gallatin, 1895, *Shear, 533;* Great Falls, 1886, *R. S. Williams, 359;* Fridley, 1887, *Tweedy, 157.*

* Juncus Tweedyi.

Juncus Canadensis coarctatus Coulter, Man. R. M. 358, at least as to the Yellowstone Park specimens.

Stem about 3 dm. high, strict, light green, 2–3 mm. in diameter: leaves terete or slightly flattened, more or less distinctly septate, with conspicuous scarious sheaths, the basal ones short; stem leaves, except the upper ones, about 1 dm. long: heads in a contracted panicle, brown and shining, 5–8-flowered: perianth-segments subequal, about 4 mm. long, narrowly lanceolate, acute or acuminate; bracts ovate, cuspidate-acuminate; stamens 3, about two-thirds as long as the perianth: anthers much shorter than the filaments; style rather short; capsule dark brown and shining, oblong, acute, sharply 3-angled, about one-fourth longer than the perianth: seeds light-colored, about 1 mm. long, tailed at both ends.

It is perhaps nearest related to *J. Canadensis*, but differs in the more contracted panicle, the larger and browner flowers, the shorter and thicker, less acuminate and very dark brown pods. In general habit, it resembles more *J. Nevadensis*, but is stouter and has only 3 stamens. It grows in bogs at an altitude of 2100 m.

YELLOWSTONE PARK: 1884, *Tweedy, 223* (type); Mud Springs, 1871, *Adams.*

* **Juncus Nevadensis** Wats. Proc. Am. Acad. **14**: 303 [Bot. Cal. **2**: 209].

This belongs to the same group as *J. Canadensis*, but is more slender, with fewer and few-flowered heads, and the flower has 6 stamens. It is found in mountain meadows at an altitude of 1800–2500 m.

MONTANA: Bozeman, 1895; *Rydberg, 2210* and *2212½;* Melrose, *2292;* Elk Mts., 1896, *Flodman, 336; Rydberg, 3237;* Spanish Basin, *3057.*

YELLOWSTONE PARK: 1884, *Tweedy, 225.*

Juncus Mertensianus Bong. Veg. Sitcha in Mem. Acad. St. Petersb. VI. **2**: 167 [Man. R. M. 358; Bot. Cal. **2**: 210].

In the mountain meadows at an altitude of 2000–3000 m.

MONTANA: Below Old Hollowtop, near Pony, July 7, 1897, *Rydberg & Bessey, 3830;* Indian Creek, July 21, *3829;* Spanish Basin, 1896, *Flodman, 340;* Litttle Belt Pass, *339;* Park Co., 1887, *Tweedy, 159;* Belt Park, 1886, *R. S. Williams, 511;* Spanish Basin, 1896, *Rydberg, 3138;* Little Belt Mts., *3331, 3332* and *3394.*

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3824;* 1885, *Tweedy, 667;* Hoodoo Basin, 1897, *P. Koch;* Yellowstone Lake and Upper Falls, *Adams.*

Juncus xiphioides montanus Engelm. Trans. Acad. Sci. St. Louis, **2**: 481 [Man. R. M. 359; Bot. Cal. **2**: 209].

Common in the mountain meadows at an altitude of 2000–3000 m.

MONTANA: Lima, 1895, *Rydberg, 2066;* Helena; Manhattan, *2197;* Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 3826;* Spanish Basin, July 1, *3828* (?, too young); Indian Creek, July 21, *3829½;* West Boulder, 1887, *Tweedy, 158;* Box Elder Creek, 1886, *R. S. Williams;* East Gallatin Swamp, 1896, *Rydberg, 3198;* Lo Lo, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: 1885, *Tweedy, 666;* 1873, *C. C. Parry, 275.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 3825.*

* **Juncus ensifolius** Wikst. Kong. Vet. Akad. Hand. **2**: 274. 1823. *Juncus xiphioides triandrus* Eng. Trans. Acad. Sci. St. Louis, **2**: 482 [Bot. Cal. **2**: 209].

Differs from the last in having only 3 stamens. It grows in similar situations, and is sometimes mixed with it.

MONTANA: Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 3827;* Spanish Basin, 1896, *Flodman, 338; Rydberg, 3030, 3075, 3099, 3102, 3112* and *3113.*

Juncoides parviflorum (Ehrh.) Coville, Contr. U. S. Nat. Herb. **4**: 209 [Ill. Fl. **1**: 397]; *Juncus parviflorus* Ehrh. Beitr. **6**: 139; *Luzula spadicea parviflora* Meyer, Linnaea, **22**: 399 [Man. R. M. 357; Bot. Cal. **2**: 202].

In mountain meadows at an altitude of 2000–2500 m.

MONTANA: Spanish Basin, July 1, 1897, *Rydberg & Bessey, 3832*: June 28, *3833*: Belt River, 1886, *R. S. Williams, 505*; Park County, 1887, *Tweedy, 160*.

YELLOWSTONE PARK: East DeLacy's Creek, August 10, 1897, *Rydberg & Bessey, 3831*: 1885, *Tweedy, 675*.

Juncoides campestre (L.) Kuntze, Rev. Gen. Pl. 722 [Ill. Fl. **1**: 398]; *Juncus campestris* L. Sp. Pl. 329: *Luzula campestris* DC. Fl. Fr. **3**: 161 [Man. R. M. 356; Bot. Cal. **2**: 203].

In mountain meadows at an altitude of 2000–2500 m.

MONTANA: Mystic Lake, 1895, *Rydberg, 2255*: Bridger Mountains, July 14, 1897, *Rydberg & Bessey, 3837*: Spanish Basin, June 28, *3835*: July 1, *3834*: 1896, *Flodman, 341*: Deer Lodge County, 1888, *Tweedy, 95*: Tiger Butte, 1886, *R. S. Williams, 506*: Spanish Basin, 1896, *Rydberg, 3081, 3110*.

YELLOWSTONE PARK: East De Lacy's Creek, August 10, 1897, *Rydberg & Bessey, 3836*: 1884, *Tweedy, 221*: 1885, *674*.

Juncoides spicatum (L.) Kuntze, Rev. Gen. Pl. 725 [Ill. Fl. **1**: 397]; *Juncus spicatus* L. Sp. Pl. 330: *Luzula spicata* DC. Fl. Fr. **3**: 161 [Man. R. M. 357; Bot. Cal. **2**: 203].

On mountain tops at an altitude of 2500 m. or more.

MONTANA: Old Hollowtop, near Pony, July 9, 1897, *Rydberg & Bessey, 3839*; Yogo, 1888, *R. S. Williams, 798*: Haystack Peak, 1887, *Tweedy, 161*.

YELLOWSTONE PARK: 1885, *Tweedy, 673*.

IDAHO: Mt. Chauvet, July 27, 1897, *Rydberg & Bessey, 3838*.

MELANTHACEAE.

Tofieldia glutinosa (Michx.) Pers. Syn. **1**: 399 [Man. R. M. 354; Ill. Fl. **1**: 400; Bot. Cal. **2**: 184; Wats. Rev.* 283].

In cold swamps in the northwestern part of the state.

MONTANA: Flathead River, 1892, *R. S. Williams, 915*: Granite, 1892, *Kelsey*: Upper Marias Pass, 1883, *Canby, 328*.

Xerophyllum Douglasii Wats. Proc. Am. Acad. **14**: 284 [Man. R. M. 354; Bot. Cal. **2**: 186].

Hillsides up to an altitude of 3000 m.

MONTANA: West Boulder, Doris Creek, Park Co., 1887, *F. Tweedy, 65*; Deer Lodge, 1888, *92*: Bozeman, 1886, *P. Koch*;

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*Watson, Revision of the N. Am. *Liliaceae* in Proc. Am. Acad. **14**: 213–303.

Sun River, 1887, *R. S. Williams, 630;* Ft. Ellis to Yellowstone, 1871, *Hayden:* Trail Creek Divide, Big Hole Valley, 1880, Watson; Jocko Range, 1880, *Watson.*

* **Stenanthium occidentale** A. Gray, Proc. Am. Acad. **8**: 405 [Bot. Cal. **2**: 145: Wats. Rev. 278].

The genus is distinguished from *Zygadenus* by its nodding flowers, and narrow glandless perianth-segments. It is only found west of the Rockies.

MONTANA: Deer Lodge Co., 1892, *Miss Emma Ware;* Flathead River, 1883, *Canby, 332:* Big Blackfoot River, *Canby;* divide between Hell Gate and Big Blackfoot, 1880, *Watson.*

Zygadenus elegans Pursh, Fl. Am. Sept. 241 [Man. R. M. 353; Ill. Fl. **1**: 405; Wats. Rev. 278].

In meadows up to an altitude of 3000 m.

MONTANA: East Gallatin Swamps, 1896, *Flodman, 342;* Mill Creek, Park Co., 1887, *F. Tweedy, 66;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 3846:* Spanish Basin, June 26 and July 1, *3845, 3848;* Belt Mts., 1890, *R. S. Williams, 25;* Gallatin Co., *Mrs. Alderson:* Bozeman, 1886, *Tweedy, 124:* Helena, 1892, *Kelsey:* Sixteen Mile Creek, 1883, *Scribner, 288;* Madison Valley, 1871, *Hayden.*

YELLOWSTONE PARK: 1884, *Tweedy, 89.*

IDAHO: Henry's Lake, July 29, 1897, *Rydberg & Bessey, 3847.*

Zygadenus venenosus S. Wats. Proc. Am. Acad. **14**: 279 [Man. R. M. 353: Ill. Fl. **1**: 405; Bot. Cal. **2**: 183].

In dry valleys and on hillsides up to an altitude of 2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 343;* Bridger Mts., June 12, 1897, *Rydberg & Bessey, 3849:* Spanish Basin, June 26, *3848;* Great Falls, 1888, *R. S. Williams, 630;* Bozeman, 1892, *W. T. Shaw:* Helena, 1891, *Kelsey;* Madison River, 1883, *Scribner, 289.*

YELLOWSTONE PARK: 1888, *Rev. Dr. Charles H. Hall;* Mammoth Hot Springs, 1885, *Tweedy, 503;* 1889, *F. W. Dewart.*

Zygadenus paniculatus (Nutt.) Wats. Bot. King's Exp. **5**: 344 [Man. R. M. 354; Bot. Cal. **2**: 185; Wats. Rev. 279]; *Helonias paniculata* Nutt. Journ. Phila. Acad. **7**: 57.

On dry hillsides in the western part of the state.

MONTANA: Deer Lodge, 1895, *F. N. Notestein;* Grasshopper Valley, *Watson, 1880.*

Veratrum Californicum Durand, Journ. Phila. Acad. **3**: 103 [Man. R. M. 353; Bot. Cal. **2**: 182; Wats. Rev. 277].

Along streams in the mountain regions up to an altitude of 3000 m.

Montana: Bridger Mountains, 1896, *Flodman, 344:* Little Belt Mts., *344½;* Bozeman, 1886, *P. Koch;* Deer Lodge Co., *Miss Emma Ware:* Belt Park, 1886, *R. S. Williams, 475:* Belt Creek, 1883, *Scribner, 287:* Loto Creek, 1880, *Watson.*

LILIACEAE.

Leucocrinum montanum Nutt.: A. Gray, Ann. Lyc. N. Y. **4**: 110 [Man. R. M. 350; Ill. Fl. **1**: 411: Bot. Cal. **2**: 157; Wats. Rev.* 240].

In sandy valleys at an altitude of 1000–2000 m.

Montana: Gallatin Co., 1888, *F. Tweedy, 102:* Bozeman, 1882: Gallatin Co., *Mrs. Alderson;* Helena, 1891, *S. A. Merritt:* Livingston, 1883, *Scribner, 275.*

Allium Sibiricum L. Man. 562 [Rydb. Bull. Torr. Bot. Club, **24**: 188]; *Allium Schoenoprasum* Wats. Proc. Am. Acad. **14**: 226 in part [Man. R. M. 347, in part].

It is much taller and stouter than *A. Schoenoprasum*, 5–6 dm. high, with only one basal leaf, with much thicker leaves and larger flowers. In meadows and rocky places at an altitude of 1000–2500 m.

Montana: Deer Lodge, 1895, *Rydberg, 2601;* Sweet Grass Cañon, 1896, *Flodman, 349;* Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 3851:* Columbia Falls, 1892, *R. S. Williams, 914:* Upper Flathead, 1883, *Canby, 316;* Smith's River, 1883, *Scribner, 276;* Grasshopper Valley, *Watson, 1880.*

Yellowstone Park: 1884, *Tweedy, 87:* 1885, *500:* 1883, *Mary Compton;* 1873, *C. C. Parry, 270* and *271.*

Allium cernuum Roth, Roem. Arch. **1**: part 3, 40 [Man. R. M. 347; Ill. Fl. **1**: 413; Wats. Rev. 226].

Hillsides and rocky places at an altitude of 1000–2500 m.

Montana: Helena, 1888, *Kelsey.*

* Allium recurvatum.

Bulb oblong-ovoid, 1–1.5 cm. in diameter, crowning a more or less persistent rhizome; coats membranous, the outer somewhat fibrous; scape slender, 3–5 dm. high, almost terete: leaves 1–2 dm. long,

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* Watson, Revision of N. Am. *Liliaceae* in Proc. Am. Acad. 14: 213-303.

1–3 mm. wide, thick, half-rounded on the back, round-channeled; umbel many-flowered, nodding; involucre two-leaved, almost 2 cm. long; perianth-segments elliptic-ovate, obtuse, about 5 mm. long, generally pink with a darker midvein; stamens and style exserted: capsule with 6 rather prominent crests at the summit.

It is nearest related to *Allium cernuum*, differing in the leaves, the more slender less ridged scape, the larger involucre, and the more distinct midveins of the perianth-segments. In the eastern *Allium cernuum*, the leaves are almost flat and more or less keeled. In *A. nutans*, there is no keel and the channel is rounded as well as the back. The leaves of *A. cernuum* are also much wider, *i. e.*, from 3 to 7 mm. wide: the flowers are generally also much paler in that species and the perianth-segments with an indistinct midvein. *A. nutans* grows on dry hills at an altitude of 1500–2000 m.

MONTANA: Lima, 1895, *Rydberg, 2602:* Elk Mts., 1896, *Flodman, 351:* Helena, 1891, *F. D. Kelsey:* Indian Creek, July 22, 1897, *Rydberg & Bessey, 3850* (type); Trail Creek, 1887, *Tweedy, 67:* Salesville, *P. W. T. Shaw:* Silver Bow Co., *Mrs. Moore;* Sixteen Mile Creek, 1883, *Scribner, 277;* Plains near Snowy Mts., 1882, *Canby;* Bannock City, 1880, *Watson:* Ross' Hole, 1880, *Watson.*

YELLOWSTONE PARK: 1884, *Tweedy, 90;* 1885, *501.*

Other specimens of *A. nutans* are the following:

SOUTH DAKOTA: Custer and Bull Springs, 1892, *Rydberg, 1035.*

WYOMING: Wallace Creek, 1894, *A. Nelson, 661;* Laramie Peak, 1895, *1633.*

WASHINGTON: Bellingham Bay, 1890, *Suksdorf, 1005:* Puget Sound, 1838–42, *Wilkes' Exped., 32.*

VANCOUVER ISLAND: Mt. Finlayson, 1887, *John Macoun.*

Allium brevistylum Wats. Bot. King's Exp. **5**: 350 [Man. R. M. 347; Wats. Rev. 226].

In wet and shady places up to an altitude of 2500 m.

MONTANA: Elk Mts., 1896, *Flodman, 352;* Park Co., 1887, *F. Tweedy;* Bridger Mts., June 18, 1897, *Rydberg & Bessey, 3856;* Spanish Basin, June 26 and July 1, *3852, 3853* and *3855;* Jack Creek, July 14, *3854;* Belt Park, 1886, *R. S. Williams, 29;* Bear Creek, 1887, *Tweedy, 69;* Gallatin Co., *Mrs. Alderson;* Bozeman Pass, 1883, *Canby, 317;* Warm Springs, Crow Creek, 1883, *Scribner, 280;* Shinberger's Cañon, 1880, *Watson.*

YELLOWSTONE PARK: 1888, *Rev. Dr. Chas. H. Hall;* 1884, *Tweedy, 86:* Grand Cañon, 1889, *F. W. Dewart;* Yellowstone Lake, 1871, *Hayden:* 1873, *C. C. Parry, 269.*

* **Allium fibrosum** Rydb. Bull. Torr. Bot. Club, **24**: 188.

This most resembles *A. Canadense*, but is distinguished by the slender habit, the bright red bulblets and the crest of the ovary. From *A. reticulatum* and *A. Geyeri* it is separated by the presence of bulblets. Mountain sides and valleys at an altitude of 2000–3000 m.

MONTANA: Lima, June 29, 1895, *Rydberg, 2606:* Beaver Head Co., 1888, *F. Tweedy, 101:* Spanish Basin, June 30, 1897, *Rydberg & Bessey, 3859:* Blackfoot River, 1883, *Canby, 319;* Bozeman Pass, 1893, *Canby, 319.*

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 499.*

Allium Nuttallii Wats. Proc. Am. Acad. **14**: 227 [Man. R. M. 348; Ill. Fl. **1**: 414].

Dry hillsides and prairies up to an altitude of 2500 m.

MONTANA: Dillon, 1895, *Rydberg, 2605.*

YELLOWSTONE PARK: 1888, *Rev. Dr. Chas. H. Hall.*

Allium reticulatum Fraser; Hook. Fl. Bor. Am. **2**: 184 [Man. R. M. 348; Wats. Rev. 227].

Dry places at an altitude of 1000–2000 m.

MONTANA: Madison River, 1883, *Scribner, 278:* Big Blackfoot River and Bozeman Pass, 1883, *Canby, 318:* Bannock City, 1880, *Watson.*

* **Allium Geyeri** Wats. Proc. Am. Acad. **14**: 227.

Stouter and taller than the preceding: perianth-segments acuminate, strongly nerved and rigid in fruit. Dry valleys up to an altitude of 2000 m.

MONTANA: Fort Benton, *John Pearsall, 1036:* Cottonwood Creek, 1892, *W. T. Shaw;* Madison Co., *Mrs. McNulty;* Great Falls, 1885, *R. S. Williams, 280;* Shields River, 1883, *Scribner, 279.*

Allium Tolmiei Baker, Bot. Mag. 6227 [Man. R. M. 349; Wats. Rev. 234].

At an altitude of 2700 m.

YELLOWSTONE PARK: 1885, *Tweedy, 498.*

* **Allium collinum** Dougl.; Wats. Proc. Am. Acad. **14**: 228.

It is characterized by the non-fibrous bulb, the outer scales of which are more or less reticulated, the low scape, the ovate-lanceolate, acute perianth-segments, which are twice as long as the stamens and style, and the capsule slightly ridged at the summit.

MONTANA: Upper Marias Pass, 1883, *Canby*, *320*.

Triteleia grandiflora Lindl.; Hook. Fl. Bor. Am. 2: 186; *Brodiaea Douglasii* Wats. Proc. Am. Acad. **14**: 237 [Man. R. M. 349; Bot. Cal. 2: 154].

Among bushes up to an altitude of 2500 m.

MONTANA: East Boulder, 1889, *Tweedy*; Bridger Mts., June 11 and 14, 1897, *Rydberg & Bessey*, *3862* and *3863*; Spanish Basin, June 24, *3861*; Deer Lodge Co., *Miss Emma Ware*; Deer Lodge, 1892, *F. N. Notestein*; Bozeman Pass, 1883, *Canby*, *315*; Bitter Root Valley, 1880, *Watson*.

* **Lilium montanum** A. Nelson, Bull. Torr. Bot. Club, **26**: 6.

It differs from *L. Philadelphicum* and *L. umbellatum* Pursh, in the shorter and broader, less distinctly clawed, perianth-segments; from the former in the form of the pod, which is elliptic-cylindric, not broadly obovoid, and from the latter in the much broader leaves. In wet meadows.

MONTANA: Rich Creek, 1883, *Canby*, *322*; Judith Mountains, 1882, *Canby*.

* **Fritillaria lanceolata** Pursh, Fl. Am. Sept. 230 [Bot. Cal. **2**: 169; Wats. Rev. 259].

Differs from *F. atropurpurea* in its broader lanceolate leaves and larger brownish purple corolla with greenish yellow spots. On hillsides at an altitude of about 2000 m.

MONTANA: Jack Creek, July 14, 1897, *Rydberg & Bessey*, *3868*; headwaters of the Missouri, *Lewis*.

Fritillaria atropurpurea Nutt. Journ. Acad. Phila. **7**: 54 [Man. R. M. 351; Ill. Fl. **1**: 419; Bot. Cal. **2**: 169; Wats. Rev. 259].

Hillsides in rich soil at an altitude of 1000–2500 m.

MONTANA: *Wyeth*; Spanish Basin, June 28, 1897, *Rydberg & Bessey*, *3867*; Gallatin Co., *Carrie Shipman*; Bozeman, 1892, *W. T. Shaw*; Belt Mts., 1890, *R. S. Williams*, *17*; Helena, 1889, *Kelsey*; Bozeman, 1883, *Scribner*, *281*; Bitter Root Valley, 1880, *Watson*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy*, *509*; 1884, *88*.

Fritillaria pudica (Pursh) Spreng. Syst. **2**: 64 [Man. R. M. 352; Bot. Cal. **2**: 170; Wats. Rev. 260]; *Lilium pudicum* Pursh, Fl. Am. Sept. 228.

In rich soil on hillsides at an altitude of 1500–2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 345*: Deer Lodge, 1888, *F. W. Traphagen*: Madison Co., 1888, *F. Tweedy, 99*: Helena, 1890, *F. D. Kelsey*: Bridger Mts., June 18, 1897, *Rydberg & Bessey, 3866*; Hell Gate, *John Pearsall, 802*; Lewis & Clarke Co., *Mrs. Muth*: Deer Lodge, 1882, *W. T. Shaw*: Bozeman Pass, 1882, *Tweedy*: Great Falls, 1889, *R. S. Williams, 24*: Helena, 1889, *Kelsey*; Bozeman Pass, 1883, *Scribner, 282*; Headwaters of the Missouri, *Lewis* (type).

YELLOWSTONE PARK: Sepulcher Mountain, 1885, *Tweedy, 508*; Mammoth Hot Springs, 1889, *F. W. Dewart*: Yellowstone, 1873, *C. C. Parry, 267*.

Erythronium grandiflorum Pursh; Lindl. Bot. Reg. 1786 [Man. R. M. 352: Bot. Cal. 2: 170; Wats. Rev. 260].

In rich wet soil on the sides of the mountains, at an altitude of 1500–2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 346* and *347*: Deer Lodge, 1888, *F. W. Traphagen*: Bridger Mts., June 15 and 18, 1897, *Rydberg & Bessey, 3869, 3870* and *3871*: Spanish Basin, July 1, *3872*: Grizzly Creek, 1887, *Tweedy, 70*: Deer Lodge Co., *Miss Hobson*: Gallatin Co., *Miss Shipman*: Clendenin, 1881, *R. S. Williams, 135*; Anaconda, 1891, *Kelsey*: Bozeman Pass, 1883, *Scribner, 283*; *Canby, 323*: Bald Mountain, Beaver Head Co., 1880, *Watson*.

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 505*: 1883, *Mary Compton*.

* **Erythronium Hendersonii** Wats. Proc. Am. Acad. 22: 479.

It is distinguished from the preceding by the light purple-tinged bases of the perianth-segments and the short brownish anthers. It grows in similar situations.

MONTANA: Bridger Cañon, 1892, *W. T. Shaw*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall*.

* **Calochortus apiculatus** Baker, Journ. Linn. Soc. 14: 305 [Bot. Cal. 2: 174: Wats. Rev. 263].

Characterized by the straw-colored umbellate flowers, and the winged capsules on reflexed pedicels.

Prairies, up to an altitude of 2000 m.

MONTANA: Clarke's Fork, 1882, *Tweedy*: Missoula Co., *Mrs. Kennedy*: Western Montana, *Miss Emma Ware*: Columbia Falls, 1892, *R. S. Williams, 635*; Blackfoot and Jocko Rivers, 1883, *Canby, 325*.

* **Calochortus macrocarpus** Dougl. Hort. Trans. **7**: 275 [Bot. Cal. **2**: 176; Wats. Rev. 266].

Resembles somewhat *C. Nuttallii*, but the petals are purplish and acute. It is rare within the region.

MONTANA: Flathead Lake, 1883, *Tweedy, 327*.

* **Calochortus acuminatus** Rydb. Bull. Torr. Bot. Club, **24**: 188.

Distinguished from *C. Nuttallii* by its acute petals and longer tapering anthers. Dry hillsides, at an altitude of 2000–3000 m.

MONTANA: Lima, August 5, 1895, *Rydberg, 2600;* Fort Custer, 1891, *Tweedy;* Cliff Lake, July 27, 1897, *Rydberg & Bessey, 3873*.

Calochortus Nuttallii T. & G. Pac. R. R. Rep. **2**: 124 [Man. R. M. 352; Ill. Fl. **1**: 422: Bot. Cal. **2**: 177: Wats. Rev. 266].

Dry hillsides at an altitude of 1000–2000 m.

MONTANA: Priest's Pass, 1891, *Kelsey;* Custer Co., 1892, *Mrs. Light*.

Calochortus Gunnisoni Wats. Bot. King's Exp. **5**: 348 [Man. R. M. 352; Ill. Fl. **1**: 422: Bot. Cal. **2**: 177; Wats. Rev. 267].

Hillsides and dry mountain valleys, at an altitude of 1000–2000 m.

MONTANA: Little Belt Mts., 1896, *Flodman, 348;* Madison Creek, 1897, *P. Koch, 61;* Little Belt Mts., 1883, *Scribner, 285*.

* **Calochortus nitidus** Dougl. Hort. Trans. **7**: 277 [Wats. Rev. 264]; *Calochortus eurycarpus* Wats. Bot. King's Exp. **5**: 348.

Characterized by the umbellate inflorescence, the sharply 3-winged pod and the rather small acute petals.

YELLOWSTONE PARK: 1873, *C. C. Parry, 265*.

* **Calochortus pavonaceus** Fernald, Bot. Gaz. **19**: 335.

Differs mainly from *C. nitidus* in the larger size of the flowers, which are generally slightly tinged with purple. It grows in meadows, at an altitude of 2000–3000 m.

MONTANA: Silver Bow Co. and Beaver Head Co., 1888, *F. Tweedy, 42;* Deer Lodge, *Miss Frances Hobson;* Priest's Pass, 1892, *Kelsey*.

YELLOWSTONE PARK: Lake, 1871, *Hayden*.

IDAHO: Henry's Lake, Aug. 1, 1897, *Rydberg & Bessey, 3874*.

Lloydia serotina (L.) Sweet, Hort. Brit. Ed. 2, 52 [Man. R. M. 352; Bot. Cal. **2**: 145; Wats. Rev. 261]; *Anthericum serotinum* L. Sp. Pl. Ed. 2, 444.

On the higher mountain tops, at an altitude of 2500 m. and more.

Montana: Park Co., 1889, *Tweedy;* Indian Creek, July 22, 1897, *Rydberg & Bessey, 3865;* Old Hollowtop, Pony Mts., July 7, *3864;* Yogo, 1888, *R. S. Williams, 776:* McDonald's Peak, 1883, *Canby, 324:* Belt Mts., 1883, *Scribner, 284.*

Yellowstone Park: Mt. Norris, 1885, *Tweedy, 502:* Soda Butte, 1885, *Tweedy, 502.*

Yucca glauca Nutt.; Fraser's Cat. 1813 [Ill. Fl. **1**: 427]; *Yucca angustifolia* Pursh, Fl. Am. Sept. 227 [Man. R. M. 351: Wats. Rev. 253].

Dry hills and plains, at an altitude of 1000–1800 m.

Montana: Great Falls, 1891, *R. S. Williams, 674:* Park Co., 1889, *Tweedy.*

Quamasia Quamash (Pursh) Coville, Proc. Biol. Soc. Wash. **11**: 64; *Phalangium Quamash* Pursh, Fl. Am. Sept. 226; *Camassia esculenta* (Ker) Lindl. Bot. Reg. **18**: 1486 [Man. R. M. 350]; *Scilla esculenta* Ker, Bot. Mag. 1574.

Hillsides and valleys, at an altitude of 1500–3000 m.

Montana: Lima, 1895, *Rydberg, 2610;* Beaver Head Co., 1888, *F. Tweedy, 100:* Priest's Pass, 1882, *Kelsey:* Lewis and Clarke Co., *Mrs. Muth;* McDonald's Pass, 1883, *Canby, 321:* Big Hole Valley, *Watson, 1880.*

CONVALLARIACEAE.

* **Clintonia uniflora** (Menz.) Kunth. Enum. **5**: 159 [Bot. Cal. **2**: 179; Wats. Rev.* 272]: *Smilacina uniflora* Menz.: Hook. Fl. Bor. Am. **2**: 175.

A more or less villous plant, with leaves resembling those of the lily-of-the-valley, and a scape with a single white flower.

Montana: Missoula Co., *Miss Hotchkiss:* White Fish Lake, 1892, *C. W. Helmich:* Jocko River, 1883, *Canby, 330.*

Vagnera amplexicaulis (Nutt.) Greene, Man. Bay Reg. 316 [Ill. Fl. **1**: 429]: *Smilacina amplexicaulis* Nutt. Journ. Phila. Acad. **7**: 58 [Man. R. M. 350: Bot. Cal. **2**: 161: Wats. Rev. 244].

Wooded hillsides, at an altitude of 1000–2500 m.

Montana: Spanish Basin, 1895, *Flodman, 353;* Park Co., 1889, *Tweedy:* Bridger Mts., June 11–18, 1897, *Rydberg & Bessey, 3876* and *3877:* Gallatin Co., *Mrs. Alderson:* Bozeman, 1892, *W. T. Shaw;* Trail Creek, 1887, *Tweedy, 71;* Great Falls, 1892, *R. S. Williams, 524:* Helena, 1892, *Kelsey;* 1883, *Scribner, 273.*

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* Watson Revision of N. A. *Liliaceae* in Proc. Am. Acad. **14**: 213–303.

YELLOWSTONE PARK: Electric Peak, August 20, 1897, *Rydberg & Bessey, 3878.*

IDAHO: Mt. Chauvet, June 29, 1897, *Rydberg & Bessey, 3879.*

* **Vagnera liliacea** (Greene); *Unifolium liliaceum* Greene, Pittonia, **1**: 280.

It differs from the eastern *V. stellata* in being glabrous, in the folded leaves and the longer pedicels; from the western *V. sessilifolia* in the leaves, which are long-acuminate and falcate at the apex. Wooded hillsides.

MONTANA: Bridger Mts., June 14, 1897, *Rydberg & Bessey, 3875;* Gallatin Co., *Mrs. Alderson;* Sheridan, 1892, *Mrs. L. A. Fitch:* Bozeman, 1883, *Scribner, 274:* Flathead Lake, 1883, *H. B. Ayres, CCCXXVII;* Bitter Root Valley, 1880, *Watson.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Tower Falls, 1885, *Tweedy, 506.*

Disporum trachycarpum (Wats.) B. & H. Gen. Pl. **3**: 832 [Ill. Fl. **1**: 432]; *Prosartes trachycarpa* Wats. Bot. King's Exp. **5**: 344 [Man. R. M. 353; Bot. Cal. **2**: 179; Wats. Rev. 270].

Mountain sides among rocks, mostly in shaded places, at an altitude of 2000–3000 m.

MONTANA: Little Belt Mts., 1896, *Flodman, 354;* Bridger Mts., June 18, 1897, *Rydberg & Bessey, 3881;* Jack Creek, July 14, *3880;* Gallatin Co., *Mrs. Alderson:* Bozeman, 1892, *W. T. Shaw;* 1887, *Tweedy, 68:* Helena, 1892, *F. D. Kelsey;* Marysville, *Miss O. B. Russell;* Bozeman, 1883, *Scribner, 286:* Judith Mts., 1882, *Canby.*

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 3882;* 1884, *F. Tweedy, 91.*

* **Disporum major** (Hook.) Britton, Bull. Torr. Bot. Club, **15**: 188; *Uvularia lanuginosa major* Hook. Fl. Bor. Am. **2**: 174; *Prosartes Oregana* Wats. Proc. Am. Acad. **14**: 211 [Bot. Cal. **2**: 179].

Distinguished by its acuminate cordate leaves, more or less villous pubescence, and acute fruit.

MONTANA: Flathead River, 1883, *Canby, 329.*

Streptopus amplexifolius (L.) DC. Fl. Franc. **3**: 174 [Man. R. M. 353; Ill. Fl. **1**: 432; Bot. Cal. **2**: 177; Wats. Rev. 269]; *Uvularia amplexifolia* L. Sp. Pl. 304.

In damp woods, up to an altitude of 2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 355:* Gallatin Co., *Mrs. Alderson:* Madison Co., 1886, *Tweedy, 1212:* Tiger Butte, 1886, *R. S. Williams, 522:* Jefferson City, 1883, *Scribner, 272.*

YELLOWSTONE PARK: 1885, *Tweedy, 507.*

TRILLIACEAE.

* **Trillium obovatum** Pursh, Fl. Am. Sept. 245; *Trillium ovatum* Wats. Proc. Am. Acad. **14**: 274, in part; not Pursh.

Distinguished from *T. ovatum* Pursh by the obovate white or rose-colored petals; the latter has oblanceolate acute and generally purplish petals. Woods, up to an altitude of 2000 m.

MONTANA: Bozeman, 1885, *Tweedy, 504:* Middle Creek, 1892, *W. T. Shaw:* Deer Lodge Co., *Miss Ware:* Gallatin Co., *Mrs. Alderson:* Flathead River, 1883, *Canby, 331;* Granite Cañon, Missoula, 1880, *Watson.*

YELLOWSTONE PARK: 1885, *Tweedy, 504.*

IRIDACEAE.

Iris Missouriensis Nutt. Journ. Acad. Phila. **7**: 58 [Man. R. M. 344; Ill. Fl. **1**: 449; Bot. Cal. **2**: 140].

In valleys, up to an altitude of 2500 m.

MONTANA: Spanish Basin, 1895, *Flodman, 356:* Bridger Mts., June 11, 1897, *Rydberg & Bessey, 3884:* Forks of the Madison, July 26, *3883:* Bozeman, 1885, *Tweedy, 511:* West Boulder, 1887, *72:* Helena, 1892, *Kelsey;* Beaver Head Co., 1888, *Tweedy, 103;* Gallatin Co., *Mrs. Alderson;* Musselshell River, 1882, *Canby:* Bozeman, 1883, *Canby, 314:* Shinberger's Cañon, 1880, *Watson.*

YELLOWSTONE PARK: 1883, *Mary Compton.*

Sisyrinchium angustifolium Mill. Gard. Dict. Ed. 7 [Ill. Fl. **1**: 454]; *Sisyrinchium mucronatum* Coult. Man. R. M. 345, in part; not Michx.; *Sisyrinchium anceps* Cav. Diss. **6**: 345, *pl. 190, f. 2.* [Man. R. M. 345, in part].

In meadows, up to an altitude of 2000 m.

MONTANA: Park Co., 1889, *Tweedy;* Helena, 1890, *Kelsey:* Willow Creek, 1888, *R. S. Williams, 276;* Deer Lodge Co., *Miss Emma Ware:* West Gallatin, 1883, *Scribner, 271:* Grasshopper Valley, 1880, *Watson;* Bridger Mts., June 12, 1897, *Rydberg & Bessey, 3888;* Pony, July 8, *3886:* Spanish Basin, June 26, *3885.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 510.*

ORCHIDACEAE.

* **Cypripedium passerinum** Richards. Frankl. Journ. App. Ed. 2, 34.

Characterized by the small white flower and obtuse sepals.

Montana: Columbia Falls, *Mrs. Kennedy, 49.*

Cypripedium parviflorum Salisb. Trans. Linn. Soc. **1**: 77 [Man. R. M. 344; Ill. Fl. **1**: 459].

In open woods, especially in damp soil, up to an altitude of 2000 m.

Montana: Helena, 1880 and 1891, *F. D. Kelsey;* Gallatin Co., *Mrs. Alderson;* Bozeman, 1885, *Tweedy, 495.*

* **Cypripedium montanum** Dougl.; Lindl. Orch. 528 [Bot. Cal. **2**: 138].

Characterized by its 1–3 flowers, its brownish petals and sepals and the dull white purple-veined lip. In open woods in the mountains, up to an altitude of 2500 m.

Montana: Deer Lodge Co., *Miss Emma Ware;* Lewis & Clarke Co., *Mrs. Muth*;* Belt Park, 1889, *R. S. Williams, 200;* Mission Range, 1883, *Canby, 313.*

* **Lysias orbiculata** (Pursh): *Orchis orbiculata* Pursh, Fl. Am. Sept. 588; *Habenaria orbiculata* Torr. Comp. 318 [Ill. Fl. **1**: 461]; *Platanthera orbiculata* Lindl. Gen. & Sp. Orch. 286.

Habenaria is a subtropical genus, characterized by the long appendages of the anther, the pistil, etc. In the United States there are only three or four species, confined to Florida and the other Gulf States. The species from the Northwest which have been included in *Habenaria* lack the long appendages altogether and were referred to the genus *Platanthera* by Lindley. The group shows so many differences in general habit and the structure of the flower, that European botanists in general acknowledge several genera; three of the groups found in Montana have no European representatives, and only one of these has received a name. The other two are named below. The original *Platanthera* Richard was constituted in 1818 and based on *Orchis bifolia; Habenaria orbiculata* and *H. Hookeri* of the northern United States and Canada are congeneric with it. The name *Platanthera* is, however, antedated by *Lysias* Salisb., of 1812, which was also based on *Orchis bifolia.* The genus *Lysias* is characterized by the two large basal leaves, the large and spreading sepals, small and narrow petals, entire linear lip, long spur, beak of stigma without appendages, and widely diverging anther-cells with small beak-like processes at the base.

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* This specimen has somewhat smaller flowers with more or less spotted lip.

L. orbiculata grows in rich woods, at a low altitude.

MONTANA: Stillwater Lake, 1892, *C. W. Helmich:* Flathead Lake, 1883, *Canby, 312.*

Lysiella.

Small plant with a short rootstock and thick root fibers. Stem scapose, naked, with a single obovate leaf at the base. Flowers greenish yellow. Upper sepal round-ovate, erect, surrounding the broad column; lateral sepals reflexed-spreading. Petals lanceolate, smaller. Lip entire, linear-lanceolate, deflexed. Spur slightly curved, shorter than the arcuate ovary. Beak of stigma not appendaged. Anther-cells widely diverging, wholly adnate, arcuate. Pod obovoid.

Apparently a monotypic genus, mainly of North America, collected at one station in northern Norway. It is nearest related to *Lysias*, differing in the single basal leaf and the structure of the flower. Name a diminutive of *Lysias.*

Lysiella obtusata (Pursh); *Orchis obtusata* Pursh, Fl. Am. Sept., 588; *Habenaria obtusata* Richards. Frankl. Journ. App. 750 [Man. R. M. 343; Ill. Fl. **1**: 461].

MONTANA: Clendenin, 1889, *R. S. Williams, 628.*

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy.*

Limnorchis.

Leafy plants with thick fleshy roots, or elongated conic undivided tubers, and small greenish or whitish flowers in a long spike. Sepals and petals free and spreading, several-nerved. Lip entire. Beak of the stigma without appendages. Anther-cells nearly parallel, wholly adnate. Gland naked. Pollinia granular, with caudicula at the base.

A North American genus of about a dozen species, differing from *Lysias* in the many stem-leaves, the parallel anther-cells, lack of processes at their bases, and a somewhat different structure of the flower.

Limnorchis hyperborea (L.); *Orchis hyperborea* L. Mant. 121; *Habenaria hyperborea* R. Br.; Ait. Hort. Kew. Ed. 2, **5**: 193 [Man. R. M. 342; Ill. Fl. **1**: 462; Bot. Cal. **2**: 134].

In bogs and wet meadows up to an altitude of 2500 m. The following specimens have been doubtfully referred here, differing from the eastern form in the somewhat longer spur:

MONTANA: Columbia Falls, *Mrs. Kennedy, 48;* Cora Creek, 1888, *A. S. Williams, 812.*

* **Limnorchis stricta** (Lindl.); *Platanthera stricta* Lindl. Gen. & Sp. Orch. 288. 1835–9; *Habenaria stricta* Rydb. Bull. Torr. Bot. Club, **24**: 189.

Characterized by its very short and saccate spur, which is scarcely more than half as long as the lip. The flowers are often more or less purplish. As the lower bracts are sometimes rather long, it has been confused with *Coeloglossum bracteatum*, in which, besides the differences in the stamen, the lip is retuse or 2-lobed at the apex. It has often been labelled *Habenaria hyperborea*, to which it is nearest related; it has, however, a longer spike, larger flowers and more strongly saccate spur. In swamps, at an altitude of 1500–2500 m.

MONTANA: Mystic Lake, 1895, *Rydberg, 2609;* Spanish Basin, 1896, *Flodman, 362;* June 28, 1897, *Rydberg & Bessey, 3894;* Pony, July 7, *3907;* Bear Creek, 1887, *Tweedy, 73;* Flathead Valley, 1893, *Canby, 311;* Prickly Pear Creek, 1883, *Scribner.*

* **Limnorchis dilatatiformis**; *Habenaria dilatatiformis* Rydberg, Bull. Torr. Bot. Club, **24**: 189: *Platanthera gracilis* Lindl. Gen. & Spec. Orch. 288 (?); *Habenaria gracilis* Wats. Proc. Am. Acad. **12**: 277 [Bot. Cal. **2**: 135]: not Hook.; *Habenaria dilatata* Coulter Man. R. M. 342, in part (?).

In general habit it most resembles *H. hyperborea*, but has larger white flowers and a dilated lip. as in *H. dilatata.* From the latter it differs in the less dilated lip and the spur, which seldom equals the ovary in length and is more or less saccate. It is common in marshy places at an altitude of 1500–2500 m.

MONTANA: Bozeman, 1895, *Rydberg, 2607;* Deer Lodge, *2608;* Spanish Basin, 1896, *Flodman, 360* and *361;* June 26–July 1, 1897, *Rydberg & Bessey, 3891, 3892, 3893, 3895* and *3896;* Old Hollowtop, Pony, July 7, *3903;* Forks of the Madison, July 26, *3606;* Pony, July 8, *3890a;* Bear Creek, 1887, *Tweedy, 74;* Gallatin Co., *Mrs. Alderson;* Columbia Falls, *Mrs. Kennedy, 48;* Lake Plateau, 1897, *Peter Koch, 89;* McDonald's Peak, 1883, *Canby, 309;* Fort Ellis to the Yellowstone, 1871, *Hayden;* Belt Creek, 1883, *Scribner, 266;* Smith River, *263;* Ray Creek, *267.*

YELLOWSTONE PARK; 1885, *Tweedy, 493;* East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3897, 3899;* Lone Star

Geyser Basin, *3894*, *3898*, *3900* (?), *3902*; 1888, *Dr. Charles H. Hall*; 1883, *Miss Compton*.

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey*, *3904* and *3905*.

* **Limnorchis leucostachys** (Lindl.): *Platanthera leucostachys* Lindl. Gen. & Spec. Orch. 288; *Habenaria leucostachys* Wats. Bot. Cal. 2: 134.

It is nearest related to *H. dilatata*, but differs in the very long spur, which is arcuate and about twice as long as the sepals. In wet places in the mountains.

MONTANA: Upper Box Elder Creek, 1886, *R. S. Williams*, *519*.

* **Coeloglossum bracteatum** (Willd.) Parl. Fl. Ital. **3**: 409: *Orchis bracteata* Willd. Sp. Pl. **4**: 34; *Habenaria bracteata* R. Br.; Ait. Hort. Kew. Ed. 2, **5**: 192 [Ill. Fl. **1**: 463].

The genus is generally accepted by European botanists. It resembles *Limnorchis* in habit, but the sepals are somewhat arcuate and bent together forming a kind of hood, the lip is 2–3-toothed at the apex, the column very short, and the glands small and surrounded by a thin membrane.

It is characterized by its long bracts, greenish flowers and the very short saccate spur. In cold bogs, at an altitude of 1000–2500 m.

MONTANA: Tiger Butte, 1886, *R. S. Williams*, *48*; Columbia Falls, *Mrs. Kennedy*, *47*; Lone Mountain, 1886, *Tweedy*, *1213*; Flathead River, 1883, *Canby*, *310*.

* **Montolivaea elegans** (Lindl.) Reichenb.; Otia Bot. Hamb. 107; *Platanthera elegans* Lindl. Gen. and Sp. Orch. 285; *Habenaria elegans* Bolander: Wats. Bot. Cal. **2**: 133, in part.

The genus somewhat resembles *Limnorchis* in the form of the flowers, but the habit is different. The true leaves are basal or nearly so, the stem leaves as a rule being small and bract-like. The flowers are small, more or less greenish; the sepals are ovate, 1-nerved and subequal; the petals and lip are very much of the same shape and slightly smaller and darker than the sepals: the column is very short. The anther is very large for the size of the flower. The anther-cells are parallel and the gland very small.

It differs from the following by the stouter stem, denser spike, longer spur and flowers nearly twice as large. On hillsides.

MONTANA: Mission Range, 1883, *Canby*, *307*.

Montolivaea Unalaschensis (Spreng.); *Spiranthes Unalaschensis* Spreng. Syst. **3**: 708; *Habenaria Unalaschensis* Wats. Proc. Am. Acad. **12**: 277 [Man. R. M. 342; Bot. Cal. **2**: 133].

Common in woods in the mountain regions, at an altitude of 1500–2500 m.

MONTANA: Jack Creek Cañon, July 15, 1897, *Rydberg & Bessey, 3889;* Bridger Mts., 1896, *Flodman, 358;* Tiger Butte, 1886, *R. S. Williams, 521;* Sixteen Mile Creek, 1883, *Scribner, 264;* Jocko River, 1883, *Canby, 308;* Mission Range, 1883, *Canby, 308;* Missoula, 1880, *Watson;* Loto Creek, 1880, *Watson.*

YELLOWSTONE PARK: Lone Star Geyser Basin, Aug. 7, 1897, *Rydberg & Bessey, 3901;* Mammoth Hot Springs, 1884, *Tweedy, 10.*

Epipactis gigantea Dougl.; Hook. Fl. Bor. Am. **2**: 220 [Man. R. M. 343; Bot. Cal. **2**: 137].

Along streams, up to an altitude of about 1500 m.

MONTANA: Sun River Cañon, 1887, *R. S. Williams, 625.*

Gyrostachys stricta; *Spiranthes Romanzoffiana* Gray, Man. Ed. 5, 504 [Bot. Cal. **2**: 135; Man. R. M. 343]; not Chamisso; *Gyrostachys Romanzoffiana* MacM. Met. Minn. 171 [Ill. Fl. **1**: 470].

The Alaskan *G. Romanzoffiana* has a very short spike, 1–2 cm. long, upper portion of the scape densely glandular, and the acuminate sepals united to near the apex. The Rocky Mountain plant differs slightly from that of Canada and the northeastern United States in being generally somewhat lower, 1–2 dm. high, with shorter spikes and broader basal leaves.

In damp woods, especially among rocks, up to an altitude of 1500–2500 m.

MONTANA: Indian Creek, July 22, 1897, *Rydberg & Bessey, 3910;* Forks of Madison, July 26, *3908;* Elk Mts., 1896, *Flodman, 363;* Tiger Butte, 1886, *R. S. Williams, 520;* Little Belt Mts., 1883, *Scribner, 268.*

YELLOWSTONE PARK: Upper Geyser Basin, August 19, 1892, *Isabel Mulford;* 1884, *Tweedy;* Mud Springs, 1871, *Hayden;* 1873, *C. C. Parry, 268.*

Listera convallarioides (Sw.) Torr. Comp. 320 [Man. R. M. 343; Ill. Fl. **1**: 473: Bot. Cal. **2**: 136]; *Epipactis convallarioides* Sw. Kongl. Vet. Akad. Handl. (II.) **21**: 232.

In damp cold woods, up to an altitude of 2000–3000 m.

MONTANA: Spanish Basin, 1896, *Flodman, 364;* Tiger Butte, 1886, *R. S. Williams, 518.*

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 488.*

* Listera nephrophylla.

Stem slender, 1–2 dm. high, glabrous, and slightly pubescent just above the leaves, two-leaved at the middle: leaves rounded reniform, about 2 cm. long and 2–2.5 cm. wide, sessile, strongly veined and reticulated, obtuse or mucronate: flowers greenish, 5–6 mm. long; sepals and petals oblong, 1.5–2 mm. long: lip 4–5 mm. long, 2-cleft, with linear-lanceolate acuminate somewhat divergent lobes and two papillose teeth at the base, divergent and directed somewhat backward; capsule broadly obovoid: stamen strongly incurved and depressed over the stigma.

It is closely related to *L. cordata* (L.) R. Br., and has been mistaken for that species. All specimens from the Rocky Mountains referred to the latter may belong to *L. nephrophylla.* This species differs from its eastern ally in the greenish, not purplish, and larger flowers, broader sepals and petals, broader reniform and more strongly reticulated leaves, and slight differences in the form of the basal teeth of the lip and the stamen. In *L. cordata* the teeth are curved forward and the stamen ascending. *L. nephrophylla* grows in moist shady woods up to an altitude of 2500 m.

MONTANA: Spanish Basin, 1895, *Flodman, 365;* Columbia Falls, 1892, *R. S. Williams, 919.*

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 489.*

Specimens have also been seen from the following localities:

COLORADO: 1891, *Dr. E. Penard.*

OREGON: 1838–42, *Wilkes Expedition, 96;* 1871, *Elihu Hall, 510.*

VANCOUVER ISLAND: Shaunigan Lake, 1893, *John Macoun, 4402.*

ALASKA: *Dall;* Kodiak, 1867, *A. Kellogg;* Unalaska, *Fricht;* Sitcha, *Trinius.*

IDAHO: Traille River, 1892, *Sandberg, MacDougal & Heller, 875.*

WASHINGTON: Westport, 1897, *F. H. Lamb, 1093.*

Peramium Menziesii (Lindl.) Morong, Mem. Torr. Bot. Club, **5**: 124 [Ill. Fl. **1**: 475]; *Goodyera Menziesii* Lindl. Gen. & Sp. Orch. 492 [Man. R. M. 343; Bot. Cal. **2**: 136].

In woods, especially in rocky places, at an altitude of 1000–2500 m.

MONTANA: Yogo Baldy, Little Belt Mts., 1896, *Flodman, 366;*

East Boulder, 1887, *Tweedy, 75;* Columbia Falls, *Mrs. Kennedy, 46;* Clendenin, 1882, *R. S. Williams, 199;* Flathead River, 1883, *Canby, 306;* Loto Creek, 1880, *Watson.*

Calypso bulbosa (L.) Oakes, Cat. Vt. Pl. 28 [Ill. Fl. **1**: 477]; *Cypripedium bulbosum* L. Sp. Pl. 951: *Calypso borealis* Salisb. Par. Lond. *pl. 89* [Man. R. M. 341; Bot. Cal. **2**: 131].

In the mountains, at an altitude of 2000–3000 m.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Trail Creek, 1885, *Tweedy;* Gallatin Co., *Mrs. Alderson;* Belt Mountains, 1880, *R. S. Williams, 44.*

Corallorhiza Corallorhiza (L.) Karst. Deutsch. Fl. 448 [Ill. Fl. **1**: 478]; *Ophrys Corallorhiza* L. Sp. Pl. 945; *Corallorhiza innata* R. Br.; Ait. Hort. Kew. Ed. 2, **5**: 209 [Man. R. M. 341; Bot. Cal. **2**: 132].

In woods, up to an altitude of 2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 367;* Clendenin, 1882, *R. S. Williams, 22.*

YELLOWSTONE PARK: 1885, *Tweedy, 497.*

Corallorhiza multiflora Nutt. Journ. Acad. Phila. **3**: 138 [Man. R. M. 341; Ill. Fl. **1**: 479; Bot. Cal. **2**: 131].

In rich woods, up to an altitude of 2500 m.

MONTANA: Gallatin Co., *F. Tweedy, 1214:* Sun River, 1887, *R. S. Williams, 627;* Bozeman, 1887, *P. Koch;* Deer Lodge Co., *Miss Emma Ware;* Beaver Creek, 1883, *Scribner, 269:* Jocko River, 1883, *Wm. Canby;* Loto Creek, 1880, *Watson.*

* **Corallorhiza Mertensiana** Bongard, Veg. Sitcha, 165 [Bot. Cal. **2**: 132].

Characterized by the narrow almost linear sepals and petals and spur, which is 2 mm. long, the lower half of it being free from the ovary. In woods, at an altitude of about 2000 m.

MONTANA: Middle Creek, 1887, *Tweedy, 1214.*

Corallorhiza stricta Lindl. Gen. & Sp. Orch. 534 [Man. R. M. 342; Ill. Fl. **1**: 479; Bot. Cal. **2**: 132].

In rich soil on wooded hillsides, at an altitude of about 2000 m.

MONTANA: Bridger Mountains, June 18, 1897, *Rydberg & Bessey, 3911.*

SALICACEAE.

Salix amygdaloides And. Öfv. Sv. Vet. Akad. Förh. **15**: 114 [Man. R. M. 334; Ill. Fl. **1**: 495].

Along streams in the prairie and plain region, seldom growing above an altitude of 1000 m.

MONTANA: Great Falls, 1886, *R. S. Williams, 422.*

* **Salix lasiandra** Benth. Pl. Hartw. 355 [Bot. Cal. **2**: 84].

At an altitude of about 2500 m.

YELLOWSTONE PARK: Junction of East Fork and Soda Butte Creek, 1885, *Tweedy, 484.*

Salix fluviatilis Nutt. Sylva, **1**: 73 [Ill. Fl. **1**: 497]; *Salix longifolia* Muhl. Neue Schrift. Ges. Nat. Fr. Berl. **4**: 238 [Man. R. M. 335; Bot. Cal. **2**: 84]; not Lam.

Along streams, up to an altitude of 2000 m.

MONTANA: Park Co., 1889, *Tweedy:* Highwood Cañon, 1888, *R. S. Williams, 803:* Bozeman, 1885, *Tweedy, 486:* Jocko River, 1883, *Canby, 285.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 482.*

Salix cordata Muhl. Neue Schrift. Ges. Nat. Fr. Berlin, **4**: 236 [Man. R. M. 335; Ill. Fl. **1**: 503: Bot. Cal. **2**: 85].

In wet places, up to an altitude of perhaps 1500 m.

MONTANA: Sun River, 1883, *Scribner, 258;* Swimming Women Creek, 1882, *Canby.*

Salix Mackenziana Barrett; Hook. Fl. Bor. Am. **2**: 149 under *Salix cordata Mackenziana* Hook. [Man. R. M. 335; Ill. Fl. **1**: 503; Bot. Cal. **2**: 86].

In the mountains, at an altitude of 2000–3000 m.

MONTANA: Boulder River, 1888, *Tweedy, 63.*

YELLOWSTONE PARK: Mt. Evarts, 1885, *Tweedy, 480.*

* **Salix lutea** Nutt. Sylva, **1**: 63, *pl. 19*; *Salix cordata lutea* Bebb, Gard. & For. **8**: 473.

Characterized by its smooth bright yellow branches.

MONTANA: Highwood Cañon, 1888, *R. S. Williams, 673.*

Salix curtiflora And. Öfvers. Vet. Akad. Förh. **15**: 130; *Salix Novae-Angliae pseudocordata* Anderson, Mon. Sal. 161 [Man. R. M. 336].

As far as the specimen cited below is concerned, it is evidently distinct from *S. Novae-Angliae.* This specimen was determined by Mr. Bebb.

MONTANA: Nevada Creek, 1883, *Canby, 283.*

Salix pseudomyrsinites And. Syn. N. A. Willows in Proc. Am. Acad. **4**: (reprint) 25; *Salix Novae-Angliae* And. Mon. Sal. 161 [Man. R. M. 335].

Rare, at an altitude of 2000–3000 m.

MONTANA: Park Co., 1887, *Tweedy, 273;* Prickly Pear Cañon, 1883, *Scribner, 261.*

YELLOWSTONE PARK: Tower Creek, 1885, *Tweedy, 483.*

* **Salix Barcleyi** Anderson, Öfv. Vet. Akad. Handl. **15**: 125 [Ill. Fl. **1**: 504].

A species with ovate serrulate leaves, pubescence floccose when young, glabrous capsule and evident style.

MONTANA: Trail Creek Mountains, 1872, *Coulter.*

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3916a* (?).

Salix Nuttallii Sargent, Gard. & For. 8: 463; *Salix flavescens* Nutt. Sylva, **1**: 65 [Man. R. M. 337: Bot. Cal. **2**: 86]; not Host.

At an altitude of about 2000 m.

MONTANA: Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 3912;* Sand Coulee, 1888, *R. S. Williams, 800.*

Salix Bebbiana Sargent, Gard. & For. 8: 463 [Ill. Fl. **1**: 498]; *Salix rostrata* Richards. Frankl. Journ. App. 753 [Man. R. M. 336]: not Thuill.

Along streams in the mountain regions, at an altitude of 1000–2000 m.

MONTANA: Boulder River, June, 1888, *F. Tweedy, 63* (light yellow bark, more silky); Spanish Basin, 1896, *Flodman, 368;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 3917;* Spanish Basin, June 26, *3918;* Bridger Mts., June 14, *3919;* Park Co., 1889, *Tweedy;* Boulder River, 1888, *Tweedy, 67;* Bozeman, 1885, *Tweedy, 479;* Highwood Cañon, 1888, *R. S. Williams, 802;* Swimming Women Creek, 1882, *Canby.*

Salix monticola Bebb; Coulter, Man. R. M., 336.

In the mountain regions, at an altitude of 1000–3000 m.

MONTANA: Highwood Cañon, 1888, *R. S. Williams, 801;* Cliff Lake, July 27, 1897, *Rydberg & Bessey, 3920;* Emigrant Gulch, Aug. 23, *3917.*

Salix candida Fluegge; Willd. Sp. Pl. **4**: 708 [Man. R. M. 337; Ill. Fl. **1**: 501].

Mountain bogs.

MONTANA: Cut Bank Creek, 1883, *Canby, 2817;* Pack River, 1861, *Dr. Lyall.*

Salix chlorophylla And. Vet. Akad. Hanl. Stockh. **6**: 138 [Man. R. M. 237].

In mountain swamps, at an altitude of 1500–3000 m.

MONTANA: East Boulder, Park Co., 1887, *Tweedy, 275;* Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey, 3915;* Gallatin Co., 1886, *Tweedy, 1185.*

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 3916.*

Salix vestita Pursh, Fl. Am. Sept. 610 [Ill. Fl. **1**: 498; Man. R. M. 339].

At an altitude of 2000–3000 m.

MONTANA: Upper Marias Pass, *Sargent;* 1883, *Canby, 292;* McDonald's Peak, *291;* Rocky Mountains, 1861, *Dr. Lyall.*

Salix saximontana Rydberg, Bull. N. Y. Bot. Gard. **1**: 261; *Salix reticulata* Bebb: Coulter, Man. R. M. 339; not L.

This species includes all specimens that have been named *S. reticulata* from the Rocky Mountains within the United States. It differs from the European *S. reticulata* in the narrower, more acute, lighter green, and less reticulate leaves, and the glabrous bracts and almost glabrous filaments. In Montana it seems to grade into *S. nivalis.* The following specimens belong here:

MONTANA: Belt Mts., 1883, *Scribner, 260.*

YELLOWSTONE PARK: 1884, *Tweedy, 33.*

Salix nivalis Hook. Fl. Bor. Am. **2**: 152; *Salix reticulata nivalis* Anders.; DC. Prod. **16**^{2}: 301 [Man. R. M. 339; Rydberg, Bull. N. Y. Bot. Gard. **1**: 262].

It is nearest related to *S. saximontana*, and perhaps represents only a most depauperate form of it, differing in the small leaves, less than 1 cm. long, which are much more reticulate than in *S. saximontana.* It is much less related to *S. reticulata*, differing in the small leaves, the 3–12-flowered short catkins which are very short-peduncled, the shorter broader and almost glabrous bracts, the glabrous filaments and shorter capsules. At an altitude of 2500–3500 m.

MONTANA: Old Hollowtop, Pony Mts., July 7 and 9, 1897, *Rydberg & Bessey, 3926.*

YELLOWSTONE PARK: Electric Peak, August 18, 1897, *Rydberg & Bessey, 3925.*

Salix petrophila Rydberg, Bull. N. Y. Bot. Gard. **1**: 268; *Salix arctica petraea* Anders. DC. Prod. **16**^{2}: 287 [Man. R. M. 338: Bot. Cal. **2**: 90]: not *S. petraea* Anders.

This should, I think, be regarded as a distinct species, differing from *S. anglorum* in the following respects: The leaves are narrower and greener: branches more slender and not turning blackish in drying; catkins much smaller and narrower; and the capsule shorter, rather ovoid and more densely villous. It is, however, much nearer to the true *S. anglorum* than the plant of the Rockies which has been regarded as that species. It grows up to an altitude of 2500 m. or more.

YELLOWSTONE PARK: Upper Falls, 1871, *Robert Adams;* Stinking Water, 1885, *Tweedy, 485.*

MONTANA: Mill Creek, 1887, *Tweedy, 271;* Boulder Creek, *272;* Old Hollowtop, near Pony, July 7, 1897, *Rydberg & Bessey, 3923;* Rocky Mountains, 1861, *Lyall:* Upper Marias Pass, 1883, *Canby, 289, 290* and *291;* McDonald's Peak, *288.*

* **Salix tenera** Anders.; DC. Prod. **16**^{2}: 288 [Rydberg, Bull. N. Y. Bot. Gard. **1**: 269].

This is nearly related to the preceding, differing in the narrow oblanceolate leaves and the few-flowered catkins. The capsule is also much shorter. It grows at an altitude of 3000 m. or more.

MONTANA: Boulder Creek, 1887, *Tweedy, 273* (?): Electric Peak, August 18, 1897, *Rydberg & Bessey, 3922.* (The last specimens are exactly like the type.)

Salix glaucops Anders.; DC. Prod. **16**^{2}: 281 [Rydberg, Bull. N. Y. Bot. Gard. **1**: 270]: *Salix glauca villosa* Anders. Sal. Bor. Am. 22 [Man. R. M. 238; Bot. Cal. **2**: 89]; *S. villosa* Don; Hook. Fl. Bor. Am. **2**: 144; not Scheich.

This represents *S. glauca* in the Rocky Mountains. It differs in the shorter capsule, darker fuscous and acutish bracts and the denser pubescence of the leaves. In age, the leaves, however, often become glabrous (var. *glabrescens* Anders.); this is especially the case at high altitudes, and as it is then very low it has been mistaken for *S. anglorum* (*S. Brownii* Lundst.), which is an arctic species. At lower altitudes it becomes a taller shrub, often 1 m. high, and would then scarcely be classified among the cespitose willows. Specimens with mature leaves much resemble *S. chlorophylla;* in fact it differs scarcely from that species, except that in *S. glaucops* the catkins are at the end of short leafy branches, while in *S. chlorophylla* they are naked from lateral buds. *S. glaucops* grows on mountain sides, at an altitude of 2000–3000 m., while *S. chlorophylla* grows in cold bogs.

MONTANA: Gallatin Co., 1886, *Tweedy, 1184:* East Boulder Plateau, 1887, *270a* and *274:* Yogo Baldy, Little Belt Mts., 1896, *Flodman, 367:* McDonald's Peak, 1883, *Canby, 284;* Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 3914.*

YELLOWSTONE PARK: Yellowstone Falls, Aug. 27, 1871, *Robert Adams* in the Hayden Survey (pistillate flowers only: the staminate flowers belonging to another species); 1884, *Tweedy, 34.*

Salix stricta (Anderson) Rydberg, Bull. N. Y. Bot. Gard. **1**: 273; *Salix desertorum stricta* Anders.: DC. Prod. **16**^{2}: 281; *S. desertorum* Bebb; Coulter, Man. R. M. 338.

It is evident that Mr. Bebb did not exactly know the true *S. desertorum*, as he states that *Drummond, 657*, represents the typical form. *Drummond, 658*, mounted on the same sheet in the Torrey Herbarium is quite different and matches Richardson's specimens exactly. They are not at all yellowish silky as is the shrub found in the Rocky Mountain Region of the United States. The leaves are only slightly hairy, and in the dry specimens dark; the catkins are longer than in our plant, and the bark is dark. In *S. stricta* the bark is often yellowish or grayish.

MONTANA: Cutbank Creek, 1883, *Canby, 286* and *294:* Red Mountain, 1888, *Tweedy, 38.*

YELLOWSTONE PARK: Lower Geyser Basin, August 4, 1897, *Rydberg & Bessey, 3913.*

* **Salix Geyeriana** And. Öfv. Vet. Akad. Förh. **15**: 122 [Bot. Cal. **2**: 87].

Like *S. erecta* and *S. Wolfii*, but differing from both in the stipitate capsule and obsolete style. The pubescence is more appressed and more finely silky.

MONTANA: Flathead River, 1883, *Canby, 295.*

Salix Wolfii Bebb, Bot. Wheeler. Exp. 241; *Salix desertorum Wolfii* Bebb; Coulter, Man. R. M. 338.

It is evidently as good a species as any, differing from *S. desertorum* in the larger glabrous capsules, the dark narrow bracts, the larger and more acute leaves, and the notched stigma. In alpine bogs, at an altitude of 2000–3000 m.

YELLOWSTONE PARK: 1886, *Tweedy, 481*; 1884, *35*.

* **Salix Dodgeana** Rydberg, Bull. N. Y. Bot. Gard. **1**: 277.

A delicate suffruticose little plant, scarcely more than 2 cm. high above ground. Stems slender but short, mostly subterranean, with brown bark; shoots, at least when young, with yellowish green bark, densely covered with leaves, the whole plant perfectly glabrous except the margins of the bracts; leaves 4–5 mm. long, oblong or oval, acutish or obtuse, light green, strongly veined; pistillate catkins generally 2-flowered, bracts oblong, truncate, sparingly villous-ciliate; capsule oblong-ovoid, glabrous, with two sessile 2-cleft stigmas; staminate catkins generally 3–4-flowered; stamens 2 with slender glabrous filaments more than twice as long as the bracts, and short anthers.

This is nearest related to *S. rotundifolia*, which, however, has nearly orbicular often emarginate leaves and more strongly ciliate obovate bracts. *S. Dodgeana* is, as far as known, the smallest willow in existence. At the original locality it was found covering whole acres of ground, growing on the mountain side at an altitude of 3200 m. Mr. Tweedy collected his specimens at about the same altitude. It was dedicated to Mr. William E. Dodge, of New York City, a friend and patron of botany.

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 3921*.

WYOMING: Sheep Mountain, Teton Forest Reserve, 1897, *Tweedy, 292*.

Populus deltoides occidentalis; *Populus angulata* Coulter, Man. R. M. 339, in part.

Leaves more acuminate than in the type, with a broader base, and more coarsely toothed. Along rivers, up to an altitude of 1500 m. Dr. Trelease had given this variety a manuscript name, which, however, can not be used, being a homonym of an already published species.

MONTANA: Missoula, 1882, *Tweedy, 389*; Upper Missouri, *J. S. Newberry*.

* **Populus balsamifera** L. Sp. Pl. **2**: 1034 [Ill. Fl. **1**: 491].

The variety *candicans*, with heart-shaped leaf base, I have not seen from Montana, but rather the species. It grows together with *P. angustifolia*, into which it sometimes grades.

MONTANA: Cache Creek, 1885, *Tweedy, 487;* Bozeman, *Mrs. Alderson:* Emigrant Gulch, 1887, *Rydberg & Bessey.*

Populus angustifolia James, Bot. Long's Exped. **1**: 497 [Man. R. M. 339: Ill. Fl. **1**: 491].

The Black Cottonwood, Narrow-leaf Poplar or Balsam is common along streams, up to an altitude of 2000 m.

MONTANA: Livingston, 1889, *Tweedy:* Boulder River, 1888, *Tweedy, 62:* Missoula, 1882, *Tweedy:* Basin, 1892, *Kelsey.*

Populus tremuloides Michx. Fl. Bor. Am. **2**: 243 [Man. R. M. 339: Ill. Fl. **1**: 492: Bot. Cal. **2**: 91]: *Populus tremula* Marshall, Arb. Am. 107, 1785; not Linn.

The Quaking Aspen is rather rare in Montana, growing at an altitude of 1000–3000 m.

BETULACEAE.

* **Betula papyrifera** Marshal, Arb. 19 [Ill. Fl. **1**: 509].

The Paper Birch, with white bark, is rather rare in Montana, and found only in the northern part of the state, at an altitude of less than 1500 m.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 905:* Little Rocky Mountains, 1889, *Dr. V. Havard.*

Betula occidentalis Hook. Fl. Bor. Am. **2**: 155 [Man. R. M. 332; Ill. Fl. **1**: 509; Bot. Cal. **2**: 79].

Along streams in the mountain regions, up to an altitude of 2500 m.

MONTANA: Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 3929:* Indian Creek, July 21, *3928:* Park Co., 1889, *Tweedy:* Cinnabar, 1884, *2;* Bozeman, 1886, *1182;* Great Falls and Belt River Cañon, 1886, *R. S. Williams, 404;* Swimming Women Creek, 1882, *Canby.*

YELLOWSTONE PARK: 1893, *Addison Brown.*

Betula glandulosa Michx. Fl. Bor. Am. **2**: 180 [Man. R. M. 332: Ill. Fl. **1**: 510; Bot. Cal. **2**: 80].

In mountain bogs and valleys, at an altitude of 1000–2500 m.

MONTANA: Sun River, 1887, *R. S. Williams, 638;* Park Co., 1887, *Tweedy, 295;* Sheep Creek, 1883, *Scribner, 255;* Virginia City, 1871, *Hayden;* Cut Bank Creek, 1883, *Canby, 281.*

YELLOWSTONE PARK: Lone Star Geyser, Aug. 7, 1897, *Rydberg & Bessey, 3927:* 1884, *Tweedy, 1:* 1885, *457.*

Alnus tenuifolia Nutt. Sylva, 1: 32; *Alnus incana glauca* Regel.; Nouv. Mem. Soc. Nat. Mosc. **13**: 154, in part; *Alnus incana virescens* Wats. Bot. Cal. **2**: 81 [Man. R. M. 332].

It grows along streams in the mountain regions, at an altitude of 1000–2000 m.

MONTANA: Melrose, 1895, *Rydberg, 2611;* Spanish Basin, June 23 and 28, 1897, *Rydberg & Bessey, 3931, 3932;* Indian Creek, July 21, 1897, *3930;* Lewis and Clarke Co., *Mrs. Muth;* Mullen Pass, 1882, *Tweedy;* West Boulder, 1887, *296;* Bozeman, 1886, *1183;* Fort Logan, 1882, *Canby;* Red Lodge, 1898, *Williams & Griffith.*

* **Alnus sinuata** (E. Regel) Rydb. Bull. Torr. Bot. Club, **24**: 189; *Alnus viridis sinuata* E. Regel; DC. Prod. **16**: part 2, 183.

Differs from *A. Alnobetula* in the thinner more shining leaves, which are more or less sinuately lobed and perfectly glabrous. It is common along streams, at an altitude of 2000–3000 m.

MONTANA: Spanish Basin, July 10, 1896, *Flodman, 369;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 3933* and *3934;* Bozeman, 1885, *Tweedy, 438;* Granite, 1892, *Kelsey;* Jocko River, 1883, *Canby, 282.*

Alnus Alnobetula (Ehrh.) K. Koch, Dend. **2**: part 1, 625; *Betula Alnobetula* Ehrh. Beit. **2**: 72 [Ill. Fl. **1**: 512]; *Betula viridis* Chaix; Vill. Hist. Pl. Dauph. **3**: 789; *Alnus viridis* DC. Fl. Fran. **3**: 304 [Man. R. M. 332].

It is rare in Montana, growing along streams, at an altitude of 1500–2000 m.

MONTANA: West Boulder, 1887, *Tweedy, 294.*

URTICACEAE.

Urtica gracilis Ait. Hort. Kew. **3**: 341 [Man. R. M. 330; Ill. Fl. **1**: 531].

Along streams and in waste places, up to an altitude of 2000 m.

MONTANA: Jack Creek, July 15, 1897, *Rydberg & Bessey, 3936;* Emigrant Gulch, Aug. 23, *3935;* Lima, 1895, *Rydberg, 2613;* Gallatin River, 1886, *Tweedy, 1093;* Hilgris and Helena, 1892, *Kelsey;* Banks of Missouri River, 1883, *Scribner, 250.*

YELLOWSTONE PARK: 1885, *Tweedy, 444.*

* **Urtica cardiophylla** Rydb. Bull. Torr. Bot. Club, **24**: 190.

Like *U. gracilis* but with broad cordate leaves, short flower-clusters and almost without bristles. On wooded creek-banks at an altitude of 1500 m.

MONTANA: Castle, Aug. 1, 1896, *Flodman, 370*.

Urtica Breweri Wats. Proc. Am. Acad. **10**: 348 [Bot. Cal. **2**: 64; Man. R. M. 330].

MONTANA: Bald Mountain, 1880, *Watson* (?).

Parietaria Pennsylvanica Muhl.; Willd. Sp. Pl. **4**: 955 [Man. R. M. 331; Ill. Fl. **1**: 534; Bot. Cal. **2**: 65].

Hillsides, in alluvial soil, etc., up to an altitude of 2000 m.

MONTANA: Pony, July 6, 1897, *Rydberg & Bessey, 3937*; Helena, 1889, *Kelsey*.

Humulus Lupulus L. Sp. Pl. 1028 [Man. R. M. 331: Ill. Fl. **1**: 530].

Along streams, in the eastern part of the state, up to an altitude of 1200 m.

MONTANA: Glendive, 1892, *Mrs. H. Miller*; Miles City, 1886, *P. Koch, 1094*; Smith River, 1883, *Scribner, 252*; McDonald's Creek, 1882, *Canby*.

LORANTHACEAE.

Razoumofskya Americana (Nutt.) Kunze, Rev. Gen. Pl. 587: *Arceuthobium Americanum* Nutt. Bost. Journ. Nat. Hist. **6**: 214 [Man. R. M. 323].

A destructive parasite, growing mostly on *Pinus contorta* and *P. Murrayana*, reaching an altitude of 2500 m.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 897* (on *Larix occidentalis*).*

YELLOWSTONE PARK: On the Madison, Aug. 2, 1897, *Rydberg & Bessey, 3938*; 1885, *Tweedy, 449* (both on *Pinus Murrayana*).

* **Razoumofskya Douglasii** (Engelm.) Kunze, l.c.; *Arceuthobium Douglasii* Engelm. Wheeler's Rep. **6**: 253 [Bot. Cal. **2**: 106].

Differs from the preceding in being smaller and with axillary staminate flowers. It grows on *Pseudotsuga*.

MONTANA: Missoula, Granite Cañon, 1880, *Watson* (determined by Engelmann).

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*The specimens (all staminate) seen, are very small and fragmentary and it is impossible to determine if they belong to this species or to some of the others, perhaps *R. occidentalis*.

SANTALACEAE.

Comandra pallida A. DC. Prod. **14**: 636 [Man. R. M. 324; Ill. Fl. **1**: 536; Bot. Cal. **2**: 104].

On plains and hillsides up to an altitude of 2000 m. It produces rootstocks a couple of meters long; I doubt if the plant is really parasitic.

MONTANA: Bridger Mountains, June 12–16, 1897, *Rydberg & Bessey, 3939, 3940* and *3941;* Spanish Basin, June 23 and 24, *3942;* Rainbow Falls. 1888, *R. S. Williams, 18:* Bozeman, 1887, *Tweedy, 163:* 1892, *W. T. Shaw;* Shields River, 1883, *Scribner, 248.*

POLYGONACEAE.

Eriogonum flavum Nutt. Fras. Cat. 1813 [Man. R. M. 314; Ill. Fl. **1**: 545; Wats. Rev. 256].*

On dry plains and hills up to an altitude of 1500 m.

MONTANA: Cottonwood Creek, 1896, *Flodman, 380;* Great Falls, 1891, *R. S. Williams, 121;* Fort Benton, *John Pearsall, 1033:* Sixteen Mile Creek, 1883, *Scribner, 231:* Belt Mountains, 1883, *Scribner, 232:* Cut Bank Creek, 1883, *Canby, 272:* Helena, *272;* Big Hole Valley, 1880, *Watson.*

* **Eriogonum androsaceum** Benth.; DC. Prod. **14**: 9 [Wats. Rev. 256].

Nearest related to *E. flavum*, but much smaller, dwarf, with yellow, sparsely villous, short-attenuate flowers. Mainly in alpine regions of British America, but the following specimens were collected within our range:

MONTANA: Upper Marias Pass, 1883, *Canby, 273.*

* **Eriogonum polyphyllum** Small.

Perennial, dwarf, tufted. Stems stout, simple or sparingly branched, 1–3 cm. long, clothed with the persistent very densely packed leaves, thus appearing 1.5–2 cm. thick; leaves numerous; blades spatulate or oblong-spatulate, 1–2 cm. long, obtuse, woolly on both sides, more or less revolute, narrowed into short petioles; scapes erect, one or several together, 1–5 cm. tall, topped by a head of usually 2–4 sessile or short-peduncled involucres, woolly like the leaves; bracts similar to the leaves but smaller, often surpassing the involucres, drooping in age; involucres becoming turbinate, about 5 mm. high, rather delicate, with both triangular and rounded teeth: calyx deep yellow, sometimes tinged with red, 3 mm., becoming 5

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* Watson, Revision of *Eriogonum* in Proc. Am. Acad. **12**: 254–269.

mm. long at maturity, clothed with appressed or ascending somewhat silky hairs; segments spatulate, the inner narrower than the outer, all obtuse, slightly crisped in age: filaments villous below the middle; achenes fully 2 mm. long, sparingly villous at the tip or glabrate.

Eriogonum polyphyllum is related to *E. flavum*. It is much smaller than any of the dwarf states of the latter species. The pubescence is more woolly and less floccose than that of *E. flavum* and is less copious on the calyx. The newly described species can be separated from its relative by the short scapes, the sessile or nearly sessile involucres and the smaller calyx which is less manifestly stipitate at the base. It grows in rocky or gravelly exposed situations at an altitude of 2700 m.

MONTANA: Old Hollowtop, Pony Mts., July 9, 1897, *Rydberg & Bessey, 5325*.

* **Eriogonum Piperi** Greene. Pittonia, **3**: 263.

Like *E. flavum* but differs in the thinner leaves, more villous pubescence, and long-acuminate base of the perianth. Dry open valleys in the mountains, at an altitude of 2000–2500 m.

YELLOWSTONE PARK: Upper Geyser Basin, 1884, *Tweedy, 17;* Upper Geyser Basin, Aug. 8, 1897, *Rydberg & Bessey, 5329;* Lone Star Geyser Basin, *5328;* Upper Falls, Aug. 14, *5327*.

MONTANA: Birch Creek, 1883, *Canby, 271;* Jocko River, *272*.

In subalpine and exposed stations it becomes low (5–10 cm. high) and more tufted, as for example the following specimens:

MONTANA: Spanish Basin, 1896, *Flodman, 378* and *381;* Elk Mts., *379;* Haystack Peak, 1887, *F. Tweedy, 101;* Madison Co., *Mrs. L. A. Fitch;* Silver Bow Co., 1888, *Tweedy, 108;* Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey, 5326*.

YELLOWSTONE PARK: 1883, *Mary Compton*.

Eriogonum caespitosum Nutt. Journ. Acad. Phila. **7**: 50 [Man. R. M. 314; Bot. Cal. **2**: 19; Wats. Rev. 256].

Dry hills at an altitude of 1000–2500 m.

MONTANA: Cottonwood Creek, 1885, *Flodman, 277*.

YELLOWSTONE PARK: Sepulcher Mt., 1885, *Tweedy, 775*.

* **Eriogonum andinum** Nutt. Journ. Acad. Phila. II., **1**: 160.

Similar to *E. caespitosum* in habit, but with smaller flowers and spatulate leaves. Dry benches at an altitude of 1500–2000 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 106;* Virginia City, 1871, *Robert Adams* (Hayden Surv.).

Eriogonum sphaerocephalum Dougl.; Benth. Trans. Lin. Soc. **17**: 407 [Bot. Cal. **2**: 19; Man. R. M. 314; Wats. Rev. 257].

Dry benches and rocky hills up to an altitude of 500 m.

MONTANA: Flathead Region, 1883, *H. B. Ayres.*

Eriogonum umbellatum Torr. Ann. Lyc. N. Y. **2**: 241 [Man. R. M. 313: Bot. Cal. **2**: 19: Wats. Rev. 257].

Dry hills at an altitude of 1000–2500 m.

MONTANA: Little Blackfoot River, *I. G. Cooper;* Grasshopper Valley, 1880, *Watson.*

YELLOWSTONE PARK: Upper Geyser Basin, 1884, *Tweedy, 2* and *20;* 1897, *Rydberg & Bessey, 5330.*

* **Eriogonum latum** Small.

Perennial, shrubby at the base. Stems copiously branching, spreading and forming large mats 3–5 dm. broad; leaves clustered at the bases of the scapes or at the ends of the branchlets, rather numerous; blades oblong, oval or elliptic, sometimes broadest slightly below or above the middle, obtuse, felty-pubescent or slightly floccose beneath, glabrous or glabrate above, cuneately narrowed at the base; petioles as long as the blades or shorter; scapes erect or ascending, 2 dm. long, more or less floccose, topped by an umbel with 3–8 rays; bracts mainly oblong or spatulate, reflexed in age; rays of the umbels stout, 2–5 cm. long; involucres several ribbed; segments usually 6–10, unequal, reflexed, mostly longer than the tube; calices very numerous in dense heads 2–2.5 cm. in diameter, light yellow or yellowish green, or purplish tinged in age, becoming 8–9 mm. long, stipe-like at the base; outer segments oblong above the cuneate base, rounded at the apex; inner segments spatulate; filaments pubescent to above the middle; ovary sparingly villous at the top; achene glabrous or nearly so.

Eriogonum latum is related to both *E. umbellatum* and *E. subalpinum.* It is more robust than either and also more woody. It may easily be distinguished by the calices which are about twice as large as those of both its relatives.

It grows in dry, gravelly soil at an altitude of 500–2500 m.

MONTANA: Cottonwood Creek, 1896, *Flodman;* Pony Mts., July 5, 1897, *Rydberg & Bessey, 5332;* Cliff Lake, July 27, *5333.*

WASHINGTON: Tumwater Cañon, 1893, *Sandberg & Leiberg, 521.*

IDAHO: Blackfoot, 1893, *Palmer, 281;* Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5331.*

* **Eriogonum subalpinum** Greene, Pittonia, **3**: 18.

Differs from *E. umbellatum* mainly in the straw colored or ochroleucous flowers. On hills at an altitude of 1500–2500 m.

Montana: Spanish Basin, 1896, *Flodman*, *374*: Cottonwood Creek, *376*; Helena, 1890, *Kelsey*; Spanish Creek, 1886, *Tweedy*, *1181*; Madison Co., 1888, *111*; Silver Bow Co., *Mrs. N. E. Caspar*; Spanish Basin, July 23–24, 1897, *Rydberg & Bessey*, *5335*: Bridger Mountains, June 18, *5334*.

Yellowstone Park: 1884, *Tweedy*, *18* and *19*: 1883, *Miss Mary Compton*.

Eriogonum heracleoides Nutt. Journ. Acad. Phila. **7**: 49 [Man. R. M. 313; Bot. Cal. **2**: 20; Wats. Rev. 257].

Dry hills at an altitude of 1000–2500 m.

Montana: *Wyeth*: Columbia Falls, 1892, *R. S. Williams*, *896*: St. Ignatius Mission, 1883, *Canby*, *275*: Forks of the Madison, 1897, *Rydberg & Bessey*, *5337*: Indian Creek, July 21, *5336*.

Yellowstone Park: 1884, *Tweedy*, *21*.

Eriogonum cernuum Nutt. Journ. Acad. Phila. II., **1**: 162 [Man. R. M. 315; Ill. Fl. **1**: 546; Bot. Cal. **2**: 23; Wats. Rev. 259].

In bad lands, cañons and on dry benches up to an altitude of 1500 m.

Montana: Manhattan, 1895, *Rydberg*, *2622*: Yellowstone, 1853, *F. V. Hayden*; Fort Benton, 1883, *Scribner*, *234*.

Eriogonum annuum Nutt. Trans. Am. Phil. Soc. II. **5**: 164 [Man. R. M. 314; Ill. Fl. **1**: 544; Wats. Rev. 262].

In sandy soil up to an altitude of 1500 m.

Montana: Lake Basin, Yellowstone Co., 1889, *Tweedy*: Billings, 1898, *Williams & Griffith*.

Eriogonum ovalifolium Nutt. Journ. Acad. Phila. **7**: 50 [Man. R. M. 315: Bot. Cal. **2**: 26; Wats. Rev. 262].

Dry and stony hillsides and benchlands at an altitude of 1000–2500 m.

Montana: Cottonwood Creek, 1896, *Flodman*, *371*; Bozeman, 1887, *Tweedy*, *99*: Silver Bow Co., 1888, *109*: Gardiner, 1885, *776*; *Wyeth*; Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *5338*; Old Hollowtop, Pony, July 9, *5338*; Cliff Lake, July 27, *5341*.

Yellowstone Park: 1884, *Tweedy*, *23*; 1883, *Miss Mary Compton*: 1873, *C. C. Parry*, *252*; Hoodoo Peak, 1897, *P. Koch*, *14;* Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 5339;* Upper Geyser Basin, Aug. 6, *5340;* Electric Peak, Aug. 18, *5342.*

* **Eriogonum ochroleucum** Small.

Perennial, tufted. Foliage white or pale pubescent throughout: leaves densely crowded on the very short stems: blades elliptic, oblong or obovate-spatulate, 1–2 cm. long, obtuse, closely floccose on both sides but less densely so above, cuneately narrowed into slender often spirally twisted petioles, these as long as the blades or somewhat shorter; scapes erect, solitary or several together, slender, conspicuously elongated, often 3–4 dm. long, rather loosely floccose, topped by a dense head 1.5–2.5 cm. in diameter: bracts triangular or lanceolate-triangular, 2–4 mm. long, acute or acuminate: involucres 5–8 in each head, closely sessile, about 3 mm. long, woolly without, rather sharply several-ribbed, with rounded or barely acute teeth; calices very numerous, ochroleucous, becoming about 4 mm. long; outer segments oblong; inner segments spatulate, slightly longer than the outer: filaments subulate, sparingly villous at the base; achene glabrous.

Related to *Eriogonum ovalifolium* Nutt., and with much the same habit, but conspicuously taller. The leaves have much longer petioles and the blades are relatively narrower than those of *E. ovalifolium.* The calices differ in their ochroleucous color, while the outer segments are merely oblong as compared with the suborbicular or orbicular-obovate segments of the Nuttallian species.

On dry hills at an altitude of 1500–2500 m.

MONTANA: Elk Mts., near Black Hawk, 1896, *Flodman, 373;* Cottonwood Creek, *372;* Great Falls, 1891, *R. S. Williams, 120;* Spanish Basin, June 23, 1897, *Rydberg & Bessey, 5343* (type): Indian Creek, July 21, *5344.*

* **Eriogonum proliferum** Torr. & Gray, Rev. Eriog. in Proc. Am. Acad. **8**: 164; *Eriogonum ovalifolium proliferum* Wats. Proc. Am. Acad. **12**: 263 [Bot. Cal. **2**: 26].

Nearest related to *E. ovalifolium*, but inflorescence cymose-umbellate.

Dry hills at an altitude of 2000–3000 m.

MONTANA: Silver Bow Co., 1888, *Tweedy, 110* and *110a;* Helena, 1890 and 1891, *Kelsey;* Madison Co., *Tweedy, 1179;* Silver Bow Co., *Mrs. Nellie Caspar.*

Eriogonum multiceps Nees, Max. Reise N. A. **2**: 446 [Man. R. M. 316; Ill. Fl. **1**: 545; Wats. Rev. 264].

Dry plains and bad lands at an altitude of 1000–2000 m.

MONTANA: White Beaver Creek, 1889, *Tweedy*.

Eriogonum campanulatum Nutt. Journ. Acad. Phila. II. **1**: 163 [Ill. Fl. **1**: 546]; *Eriogonum brevicaule* Nutt. Journ. Acad. Phila. II. **1**: 163 [Man. R. M. 316; Wats. Rev. 266].

On dry hills and plains up to an altitude of 2500 m.

MONTANA: Livingston, 1886. *Tweedy*.

Eriogonum microthecum Nutt. Journ. Acad. Phila. II., **1**: 162 [Man. R. M. 316; Ill. Fl. **1**: 544; Bot. Cal. **2**: 28: Wats. Rev. 265].

Dry prairies up to an altitude of 2000 m.

MONTANA: Melrose, 1895, *Rydberg, 2619:* Upper Missouri, 1867, *T. V. Hayden:* Logan, 1895, *Rydberg:* Ruby River, 1887, *Tweedy, 100;* Beaver Head Co., 1888, *107*.

* **Eriogonum Simpsonii** Benth. DC. Prod. **14**: 18.

Nearest related to *E. microthecum*, but with very narrowly linear leaves. Dry benches at an altitude of about 2000 m.

MONTANA: Lewis and Clarke Co., 1894, *E. Douglas:* Madison Co., 1886, *Tweedy*.

Rumex Acetosella L. Sp. Pl. 338 [Man. R. M. 318; Ill. Fl. **1**: 547; Bot. Cal. **2**: 10].

Introduced and readily establishing itself in waste places, old fields and sandy soil.

MONTANA: Missoula, 1898, *Williams & Griffith*.

Rumex Geyeri (Meisner) Trelease, Ann. Rep. Mo. Bot. Gard. **3**: 78; *Rumex Engelmannii Geyeri* Meisn. DC. Prod. **14**: 64: *Rumex paucifolius* Nutt. Wats. Bot. King's Exp. **5**: 314 [Man. R. M. 318; Bot. Cal. **2**: 10].

In meadows at an altitude of 2000–2500 m.

MONTANA: Spanish Peaks, 1896, *Flodman, 402;* Bridger Mts., *403;* Yogo, 1888, *R. S. Williams, 396;* Lewis and Clarke Co., *Mrs. Muth;* Davis Creek, 1887, *Tweedy, 103;* Bridger Mts., June 12–18, 1897, *Rydberg & Bessey, 5346* and *5347;* Spanish Basin, June 28, *5348*.

YELLOWSTONE PARK: 1873, *C. C. Parry, 249;* 1885, *Tweedy, 771;* Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey, 5345*.

Rumex persicarioides L. Sp. Pl. 335 [Ill. Fl. **1**: 552]; *Rumex maritimus* L. l.c. [Man. R. M. 318; Bot. Cal. **2**: 9].

In water up to an altitude of 2500 m.

MONTANA: Great Falls, *R. S. Williams, 395;* Little Prickly Pear Cañon, 1883, *Scribner, 244.*

YELLOWSTONE PARK: Turbid Lake, 1885, *Tweedy, 774;* Mammoth Hot Springs, 1884, *24.*

Rumex salicifolius Weinm.; Flora, **4**: 28 [Man. R. M. 317; Ill. Fl. **1**: 549: Bot. Cal. **2**: 8].

In swamps, along streams, etc., up to an altitude of 2500 m.

MONTANA: Sand Coulee, *R. S. Williams, 294:* Gallatin Co., *Mrs. Alderson:* Crow Creek, 1883, *Scribner, 246;* Cliff Lake, July 27, 1897, *Rydberg & Bessey, 5349.*

YELLOWSTONE PARK: 1885, *Tweedy, 773.*

Rumex occidentalis S. Wats. Proc. Am. Acad. **12**: 253 [Man. R. M. 317; Ill. Fl. **1**: 550: Bot. Cal. **2**: 8].

In wet meadows up to an altitude of 2000 m.

MONTANA: Deer Lodge, 1895, *Rydberg, 2614;* Fridley, 1887, *Tweedy, 104:* Gallatin River, 1886, *1203;* Box Elder Creek, 1887, *R. S. Williams, 394:* Fort Maginnis, 1882, *Canby;* Forks of the Madison, July 27, 1897, *Rydberg & Bessey, 5350.*

Rumex venosus Pursh, Fl. Am. Sept. 733 [Man. R. M. 317; Ill. Fl. **1**: 548: Bot. Cal. **2**: 8].

In sandy soil at an altitude of 1000–2500 m.

MONTANA: Beaver Head Co., 1888, *Tweedy, 104;* Missoula Co., *Mrs. Kennedy:* Great Falls, 1892, *R. S. Williams, 393;* Glendive, 1892, *Mrs. Wm. G. Bailey;* Madison River, 1883, *Scribner, 247.*

YELLOWSTONE PARK; Steven's Island, 1885, *Tweedy, 772.*

Oxyria digyna (L.) Camptdera, Rumex, 155, *pl. 3. f. 3* [Man. R. M. 317; Ill. Fl. **1**: 553; Bot. Cal. **2**: 7]; *Rumex digynus* L. Sp. Pl. 337.

Among rocks on the highest mountains at an altitude of 2500–3500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 404;* Haystack Peak, 1887, *Tweedy, 102:* Yogo, 1888, *R. S. Williams, 769;* Lake Plateau, 1897, *P. Koch, 47* and *48;* McDonald's Peak, 1883, *Canby, 227;* Little Belt Mts., 1883, *Scribner, 243;* Cedar Mts., July 16, 1897, *Rydberg & Bessey, 5351;* Old Hollowtop, Pony Mts., July 7–9, *5352;* Mt. Chauvet, July 29, *5354.*

YELLOWSTONE PARK: 1884, *Tweedy;* Yellowstone Lake, 1871, *Hayden;* Electric Peak, Aug., 1897, *Rydberg & Bessey, 5353.*

Polygonum viviparum L. Sp. Pl. 360 [Man. R. M. 321: Ill. Fl. **1**: 555: Bot. Cal. **2**: 15: Small, Mon. 30.*]

In alpine bogs, at an altitude of 2500–3000 m.

MONTANA: Yogo, 1888, *R. S. Williams, 624:* East Boulder, 1887, *Tweedy, 108:* Stillwater, 1897, *P. Koch, 72:* Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey, 5355.*

YELLOWSTONE PARK: 1884, *Tweedy, 27:* Falls of the Yellowstone, 1871, *Hayden.*

Polygonum bistortoides Pursh, Fl. Am. Sept. 271; *Polygonum Bistorta oblongifolium* Meisn. in DC. Prod. **14**: 126 [Man. R. M. 320; Bot. Cal. **2**: 15: Small, Mon. 28].

The European *P. Bistorta* has oblong leaves, truncate or subcordate at the base. *P. bistortoides* grows in mountain meadows, at an altitude of 1800–2500 m.

MONTANA: Little Belt Mts., 1896, *Flodman, 384:* Yogo, 1888, *R. S. Williams, 39:* Gallatin Co., *Mrs. Alderson:* Haystack Peak, 1887, *Tweedy, 107:* Fort Ellis, 1883, *Scribner, 236:* Bridger Mts., June 11–14, *Rydberg & Bessey, 5356.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1893, *F. H. Burglehaus;* 1888, *Dr. Chas. H. Hall;* 1883, *Miss Mary Compton;* 1885, *Tweedy, 777.*

Polygonum bistortoides linearifolium (Nutt.) Small, Bull. Torr. Bot. Club, **19**: 352 [Small, Mon. 29]: *Polygonum Bistorta linearifolium* Wats. Bot. King's Exp. 317 [Man. R. M. 321].

It grows in wet places on the higher mountains, at an altitude of 3000–3500 m.

MONTANA: Lima, 1895, *Rydberg:* Spanish Peaks, 1896, *Rydberg:* Indian Creek, July 22, 1897, *Rydberg & Bessey, 5357.*

YELLOWSTONE PARK: 1883, *Miss Mary Compton:* Hot Sulphur Spring, 1871, *Hayden.*

Polygonum amphibium L. Sp. Pl. 361 [Man. R. M. 320; Ill. Fl. **1**: 555; Bot. Cal. **2**: 13; Small, Mon. 40].

In lakes and ponds up to an altitude of 2500 m.

MONTANA: Sun River Cañon, 1887, *R. S. Williams, 625:* Silver Bow Co., *Mrs. Dolman;* Bozeman, 1886, *P. Koch, 1202* in part: Fridley, 1887, *Tweedy, 109:* Horned Creek, 1883, *Scribner, 237:* Cliff Lake, July 27, 1897, *Rydberg & Bessey, 5358.*

YELLOWSTONE PARK: Yellowstone Lake, 1885, *Tweedy, 778.*

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* Small, Monograph of the N. Am. Species of *Polygonum*, in Mem Dep. Bot. Columbia Coll., Vol. I.

Polygonum emersum (Michx.) Britton, Trans. N. Y. Acad. Sci. **8**: 73 [Ill. Fl. **1**: 556; Small, Mon. 44]; *Polygonum amphibium emersum* Michx. Fl. Bor. Am. **1**: 240; *Polygonum Muhlenbergii* S. Wats. Proc. Am. Acad. **14**: 295 [Man. R. M. 320; Bot. Cal. **2**: 13].

In wet places up to an altitude of 1800 m.

MONTANA: Logan, 1895, *Rydberg, 2615;* Gallatin Co., *Mrs. Alderson:* Bozeman, 1886, *Tweedy, 1201;* Great Falls, 1886, *R. S. Williams, 480;* Box Elder Creek, 1887, *625;* Missouri River, 1883, *Scribner, 238;* Missoula, 1880, *Watson.*

Polygonum Hartwrightii Gray, Proc. Am. Acad. **8**: 294 [Man. R. M. 320; Ill. Fl. **1**: 556; Bot. Cal. **2**: 14; Small, Mon. 42].

Borders of lakes and ponds up to an altitude of 1600 m.; rare.

MONTANA: Bozeman, 1886, *P. Koch, 1202,* in part; Bozeman, 1886, *Tweedy, 1201;* Missoula, 1898, *Williams & Griffith.*

Polygonum lapathifolium nodosum (Pers.) Small, Mem. Torr. Bot Club, **5**: 140 [Ill. Fl. **1**: 557: Small, Mon. 55]; *Polygonum nodosum* Pers. Syn. **1**: 440 [Man. R. M. 320; Bot. Cal. **2**: 13].

In wet places up to an altitude of 2000 m.

MONTANA: Bozeman, 1886, *P. Koch, 1200; W. T. Shaw;* Little Prickly Pear Creek, 1883, *Scribner, 239.*

Polygonum lapathifolium incanum (Smith) Koch, Syn. Fl. Germ. 711 [Man. R. M. 319; Ill. Fl. **1**: 557; Small, Mon. 54]: *Polygonum incanum* Smith, Fl. Boem. **4**: 90.

In low lands up to an altitude of 1500 m.

MONTANA: East Gallatin Swamps, 1896, *Flodman, 387.*

* **Polygonum Persicaria** L. Sp. Pl. 361 [Ill. Fl. **1**: 558: Small, Mon. 66].

Differs from *P. lapathifolium* by the bristle-fringed ocreae and the dark blotch on the leaves. It belongs to the prairie region, but extends along the Yellowstone up to an altitude of about 1500 m.

MONTANA: Big Timber, 1892, *Kelsey.*

* **Polygonum littorale** Link; Schrad. Journ. **1**: 54 [Ill. Fl. **1**: 562; Small, Mon. 102].

Differs from *P. aviculare* in the more obtuse leaves and the style, which is 3-parted to the base. In sandy soil up to an altitude of 2500 m.

MONTANA: Cottonwood Creek, 1896, *Flodman, 398;* Helena, 1892, *Kelsey;* Missoula, 1898, *Williams & Griffith;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 5359:* Spanish Basin, July 20, *5360* (?).

YELLOWSTONE PARK: Lake, 1885, *Tweedy, 783.*

Polygonum ramosissimum Michx. Fl. Bor. Am. **1**: 237 [Man. R. M. 319: Ill. Fl. **1**: 564: Bot. Cal. **2**: 12; Small, Mon. 114].

In low sandy or saline soil up to an altitude of 2000 m.

MONTANA: Great Falls, 1886, *Tweedy, 211* and *536:* Otter Creek, 1883, *Scribner, 240.*

Polygonum Douglasii Greene, Bull. Cal. Acad. II. **1**: 125 [Ill. Fl. **1**: 565: Small, Mon. 118]: *Polygonum tenue* Engelmann; Gray, Proc. Acad. Phila. **1863**: 75 [Man. R. M. 319].

MONTANA: Elk Mts., near Castle, 1896, *Flodman, 392:* Cottonwood Creek, *394:* Mill Creek, 1887, *Tweedy, 105:* Upper Box Elder Creek, 1886, *R. S. Williams, 362;* Helena, 1892, *Kelsey;* Bozeman, 1892, *W. T. Shaw:* Pony, July 6, 1897, *Rydberg & Bessey, 5361:* Spanish Basin, June 23–24, *5362:* Jack Creek Cañon, July 14, *5363.*

YELLOWSTONE PARK: 1885, *Tweedy, 782.*

Polygonum Douglasii montanum Small, Mem. Dep. Bot. Columbia Coll. **1**: 118: *Polygonum tenue latifolium* Engelm. Proc. Acad. Phila. 75 [Man. R. M. 319]: *Polygonum Douglasii latifolium* Greene, Bull. Cal. Acad. **1**: 125.

MONTANA: Spanish Basin, 1896, *Flodman, 388:* Long Baldy, Little Belt Mts., *389:* Elk Mts., near Black Hawk, *390:* Boulder Creek, 1887, *Tweedy, 106.*

YELLOWSTONE PARK: Brain Peak, 1885, *Tweedy, 780:* East De Lacy's Creek, Aug. 10, *Rydberg & Bessey, 5364* and *5365.*

Polygonum Engelmannii Greene, Bull. Calif. Acad. Sci. **1**: 126 [Small, Mon. 124]; *Polygonum tenue microspermum* Engelm. in Gray, Proc. Am. Acad. **1863**: 75 [Man. R. M. 319].

In sandy soil at an altitude of 1500 m.

MONTANA: Cottonwood Creek, 1896, *Flodman, 400:* Sweet Grass Cañon, *399.*

YELLOWSTONE PARK: Shoshone Lake, 1897, *Rydberg & Bessey, 5369.*

* **Polygonum Austinae** Greene, Bull. Calif. Acad. Sci. **2**: 212 [Small, Mon. 126].

It is distinguished from *P. Engelmannii* by the achenes, which are constricted at both ends, and by the generally broader leaves.

MONTANA: Sweet Grass Cañon, Sept., 1896, *Flodman, 401.*

* **Polygonum Nuttallii** Small, Mem. Dep. Bot. Columbia College, **1**: 132: *Polygonum intermedium* Nuttall; Wats. Proc. Am. Acad. **17**: 378; not Ehrh.

In this as in *P. spergulariaeforme* the flowers are in interrupted racemes at the ends of the branches: it differs from that species in its ovoid, not oblong, achenes and dilated filaments.

* **Polygonum spergulariaeforme** Meisn.; Small, Bull. Torr. Bot. Club, **19**: 366 [Small, Mon. 130]: *Polygonum coarctatum* Dougl.; Hook. Fl. Bor. Am. **2**: 133 [Bot. Cal. **2**: 12]; not Willd.

In sandy soil at an altitude of 1500–2000 m.

MONTANA: Sixteen Mile Creek, 1883, *Scribner, 242:* Musselshell River, 1882, *Canby;* Billings, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: Lake, 1871, *Robert Adams* (Hayden Surv.); 1883, *Miss Mary Compton.*

* **Polygonum Kelloggii** Greene, Fl. Fran. 134 [Small, Mon. 134]. *Polygonum coarctatum minus* Meisn. in DC. Prod. **14**: 101.

Characterized by the continuous leafy terminal racemes, the annual root and low habit, the stems being only 1–5 cm. long. In sandy soil.

YELLOWSTONE PARK: Yellowstone Lake, 1871, *R. Adams.*

* **Polygonum polygaloides** Meisner, in DC. Prod. **14**: 101 [Bot. Cal. **2**: 12; Small, Mon. 136].

MONTANA: Beaver Head Co., 1888, *Tweedy, 104* and *105.*

YELLOWSTONE PARK: 1884, *Tweedy, 26.*

Polygonum Watsonii Small, Mem. Dep. Bot. Columbia Coll. **1**: 138; *Polygonum imbricatum* Nutt.; Wats. Am. Nat. **7**: 665 [Man. R. M. 319]: not Raf.

Margins of dried pools, at an altitude of 2000–2500 m.

MONTANA: Cedar Mts., July 16, 1897, *Rydberg & Bessey, 5366.*

YELLOWSTONE PARK: Mt. Evans, 1884, *Tweedy, 25.*

* **Polygonum unifolium** Small.

Annual, dwarf, glabrous. Stems erect, 1–3 cm. tall, simple, very slender and wiry, naked or nearly so below; leaves mostly solitary at the middle of the stem; blades narrowly linear, erect, 7–10 mm.

long, acute, 1-ribbed, sessile: ocreae silvery, 2-parted, segments lanceolate, acuminate; bracts several, crowded at the top of the stem, imbricated, linear to linear-lanceolate, acute, ascending: calyx about 1.5 mm. long, its segments ovate, acute, white or pinkish, with a short green midrib, the outer involute and slightly keeled in age; stamens minute: style 3-parted; segments very small, spreading; achenes 3-angled, about 1.3 mm. long, lustrous, slightly margined, included.

It is very closely related to *P. Watsonii*, differing mainly in the mostly solitary and long leaf and shorter bracts, and it grows in wet places, especially along margins of pools, at an altitude of 2000–2500 m.

MONTANA: Beaver Head Co., 1888, *Tweedy:* Cedar Mts., July 16, 1897, *Rydberg & Bessey, 5367:* Shoshone Lake, Aug. 10, *5368.*

* **Polygonum paronychioides** Small.

Annual, bushy. Foliage glabrous: stems copiously branched at the base and above: branches slender, rather wiry, 8–15 cm. long, erect or ascending, clothed with a shining bark, somewhat zigzag; leaves remote below, approximate above: blades linear, 8–10 mm. long, with an acute green tip, entire, jointed to the short very delicate soon lacerate ocreae, 1-nerved: calices short-pedicelled, solitary or few together; segments green, with pale or pink margins, narrowly-ovate to oblong-lanceolate, slightly accrescent, becoming fully 2 mm. long, slightly keeled, acutish; achenes rhombic with the distal end longer, and slightly acuminate, about 2 mm. long, 3-angled, granular.

Polygonum paronychioides is most closely related to *Polygonum Watsonii*, but differs from that species in the very bushy habit and the leaves are much shorter and more numerous. The inflorescence of the two species is different, that of the plant just described being scattered along the branches and not collected at the ends in closely bracted racemes. The calyx and the achene are narrower and longer than in *P. Watsonii.*

In meadows and edges of ponds.

MONTANA: South of Birch Lake, 1883, *Canby, 279* (type in herb. College of Pharmacy, New York).

Polygonum Convolvulus L. Sp. Pl. 364 [Man. R. M. 321: Ill. Fl. **1**: 565: Bot. Cal. **2**: 15].

Introduced into waste places.

MONTANA: Bozeman, 1892, *W. T. Shaw:* Missoula, 1880, *Watson.*

CHENOPODIACEAE.

Chenopodium album L. Sp. Pl. 219 [Man. R. M. 307; Ill. Fl. **1**: 570; Bot. Cal. **2**: 46: Wats. Rev. Chen. 96].*

Common in waste places: introduced.

MONTANA: Mead's Springs, July 27, 1871, *Robert Adams* (Hayden's Surv.): Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 3945* and *3947*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1894, *F. H. Burglehous*: Upper Geyser Basin, Aug. 8, 1897, *Rydberg & Bessey, 3946*.

Chenopodium leptophyllum (Moq.) Nutt.; DC. Prod. **13**^{2}: 71 as synonym under *Chenopodium album leptophyllum* Moq. [Man. R. M. 308; Ill. Fl. **1**: 571; Bot. Cal. **2**: 47; Wats. Rev. 94].

In old fields, on roadsides, etc., up to an altitude of 2500 m.

MONTANA: Fridley, 1887, *Tweedy, 276*: Bull Mountain, 1882, *Canby*.

YELLOWSTONE PARK: Yellowstone Lake, 1885, *Tweedy, 462*.

* Chenopodium atrovirens.

Stem 3–5 dm. high, branched, striate, obtusely angled; leaves slender-petioled, broadly ovate, obtuse, truncate, or the upper mucronate, entire, sometimes slightly hastately lobed at the base, three-nerved, very dark green, only sparingly mealy, rather thick and somewhat fleshy, 1–3 cm. long and 5–15 mm. wide; flowers in small spike-like glomerules in the axils of the leaves and in compound interrupted spikes at the ends of the branches, very small and sparingly mealy; seeds lenticular, 1 mm. long, almost black, smooth, easily separating from the pericarp.

It much resembles *C. olidum*, but differs in the darker green color of the leaves and stem, the sparser mealiness, the smaller flowers and the easily separated seeds, which are not pitted as are those of *C. olidum*. The type was growing on a dry hillside together with *Mentzelia tenerrima* and *Symphoricarpos vaccinioides*, under some trees of *Pseudotsuga mucronata*.

MONTANA: Foothills of Electric Peak, August 18, 1897, *Rydberg & Bessey, 3948* (type).

YELLOWSTONE PARK: Stevenson Island, 1885, *Tweedy, 459*.

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* Watson, Rev. N. A. *Chenopodiaceae* in Proc. Am. Acad. 9: 82–126.

Chenopodium Fremontii Wats. Bot. King's Exp. **5**: 287 [Man. R. M. 308; Ill. Fl. **1**: 572; Bot. Cal. **2**: 47; Wats. Rev. 94].

In cañons, up to an altitude of 2000 m.

MONTANA: South Fork of Judith River, 1896, *Flodman, 408*: Jack Creek, July 10, 1897, *Rydberg & Bessey, 3849*: Forstall's Ranch, 1882, *Canby*: Ross' Hole, 1880, *Watson*.

* **Chenopodium murale** L. Sp. Pl. 219 [Ill. Fl. **1**: 573: Bot. Cal. **2**: 47; Wats. Rev. 97].

An introduced species, characterized by its coarsely toothed leaves and its short and loosely panicled spikes in the axils of the leaves.

MONTANA: Mead's Springs, July 27, 1871, *Robert Adams* (Hayden Survey) mixed with *C. album*.

Chenopodium glaucum L. Sp. Pl. 220 [Man. R. M. 307; Ill. Fl. **1**: 571]: *Blitum glaucum* Koch, Syn. Fl. Germ. 608 [Wats. Rev. 101].

Waste places and saline soil, up to an altitude of 2500 m.

MONTANA: Manhattan, 1895, *Rydberg, 2629*: Madison Co., 1871, *T. C. Porter* (Hayden Survey); Helena, 1892, *F. D. Kelsey*.

YELLOWSTONE PARK: Yellowstone Lake, 1884, *Tweedy, 272*.

Chenopodium humile Hook. Fl. Bor. Am. **2**: 127; *Blitum rubrum humile* Moquin in DC. Prod. **13**^{2}: 84 [Wats. Rev. 100]: *Chenopodium rubrum humile* Wats. Bot. Cal. **2**: 48 [Man. R. M. 308].

Saline soil, up to an altitude of 2500 m.

YELLOWSTONE PARK: Turbid Lake, 1885, *Tweedy, 460*.

* **Chenopodium Botrys** L. Sp. Pl. 219 [Ill. Fl. **1**: 574; Bot. Cal. **2**: 47; Wats. Rev. 98].

An introduced strong-scented glandular species with pinnately lobed leaves.

MONTANA: Helena, 1888 and 1892, *Kelsey*.

Blitum capitatum L. Sp. Pl. 4 [Ill. Fl. **1**: 576: Wats. Rev. 100]; *Chenopodium capitatum* Aschers. Fl. Brand. 572 [Man. R. M. 308: Bot. Cal. **2**: 48].

In rich soil, up to an altitude of 2500 m.

MONTANA: Little Belt Mts., 1896, *Flodman, 409*: Deep Creek, 1891, *R. S. Williams, 859*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 273*.

Suckleya Suckleyana (Torr.); *Obione Suckleyana* Torr. Pac. R. R. Rep. **12**: 47, 1860; *Suckleya petiolaris* Gray, Proc. Am. Acad. **11**: 103, 1876 [Man. R. M. 311].

MONTANA: Milk River, 1853 (Stevenson Exped.), *Suckley*.

Grayia spinosa (Hook.) Moquin in DC. Prod. **13**^{2}: 119, 1849; *Chenopodium spinosum* Hook. Fl. Bor. Am. **2**: 127, 1834; *Grayia polygaloides* H. & A. Bot. Beechey, 387, 1841 [Man. R. M. 311; Bot. Cal. **2**: 56; Wats. Rev. 122].

In alkaline soil, up to an altitude of 2500 m.

MONTANA: Beaver Head Co., 1888, *Tweedy, 127*.

Monolepis Nuttalliana (Schult.) Greene, Fl. Fran. 168 [Ill. Fl. **1**: 577]; *Blitum chenopodioides* Nutt. Gen. **1**: not Lam.; *Blitum Nuttallianum* Schult. Mant. **1**: 65; *Monolepis chenopodioides* Moq. in DC. Prod. **13**^{2}: 85 [Man. R. M. 309; Wats. Rev. 102; Bot. Cal. **2**: 49].

In alkaline soil, up to an altitude of 2000 m.

MONTANA: Spanish Basin, June 30, 1897, *Rydberg & Bessey, 3950;* Beaver Head Co., 1888, *Tweedy, 126;* Great Falls, 1886, *R. S. Williams, 408;* Madison River, 1883, *Scribner, 223*.

* **Atriplex hortensis** L. Sp. Pl. 1053.

Escaped from cultivation. It has cordate triangular sinuately toothed leaves, and round entire-margined bracts.

MONTANA: Broadwater, Helena, 1892, *Kelsey*.

Atriplex hastata L. Sp. Pl. 1053 [Ill. Fl. **1**: 578]; *Atriplex patula hastata* Gray, Man. Ed. **5**: 409 [Man. R. M. 309; Bot. Cal. **2**: 51; Wats. Rev. 107].

In alkaline flats, up to an altitude of 1500 m.

MONTANA: Great Falls, 1886, *R. S. Williams, 478*.

* Atriplex lapathifolia.

Annual, rather strict, 4–6 dm. high; stem somewhat striate and with more or less ascending branches; leaves somewhat fleshy, dark green; petioles about 1 cm. long; blades lanceolate, 3–6 cm. long, entire and with a strong midrib; pistillate flowers in several interrupted spikes; bracts broadly ovate-triangular, in fruit about 4 mm. long and 5 mm. wide, united at the base, often slightly hastately toothed at the base, not at all produced or foliaceous at the apex, sometimes with one or two tubercles on the back, thin, veiny, acute or slightly acuminate at the apex.

Nearest related to *A. patula* and *A. hastata*, but differs from the former in the strict habit and the dark leaves, from the latter in the narrower, not hastate, leaves, and from both in the bracts, which are thinner and not foliaceous at the apex. The leaves resemble those of *Polygonum lapathifolium*, hence the name. It grows on alkaline flats, at an altitude of about 1500 m.

MONTANA: Fridley, on the Yellowstone River, 1887, *Tweedy, 278.*

WYOMING: Laramie, 1895, *Aven Nelson, 1866*, also apparently belongs here although it has bracts which are slightly foliaceous and more toothed.

***Atriplex truncata** (Torr.) Gray, Proc. Am. Acad. **8**: 398 [Bot. Cal. **2**: 52; Wats. Rev. 111]; *Obione truncata* Torr.: Wats. King's Exped. **5**: 291.

A species with small short broadly ovate leaves, truncate or cordate at the base; fruiting bracts ovate-oblong, truncate and obtusely 3-toothed at the apex.

MONTANA: Fridley, 1887, *Tweedy, 279;* Yellowstone River, 1882, *Canby.*

Atriplex argentea Nutt. Gen. **1**: 198 [Man. R. M. 310; Ill. Fl. **1**: 579; Bot. Cal. **2**: 53; Wats. Rev. 115].

On alkali flats in the plain region, up to an altitude of 2000 m.

MONTANA: Musselshell River, 1896, *Flodman, 407:* Helena, 1889, *Kelsey.*

***Atriplex phyllostegia** (Torr.) Wats. Proc. Am. Acad. **9**: 108: *Obione phyllostegia* Torr.; Wats. King's Exp. **5**: 291.

A species with rhombic-triangular or hastate leaves, subdioecious flowers in axillary clusters, a short subnaked spike, and ovate entire bracts.

MONTANA: Lima, 1895, *Rydberg, 2626.*

Atriplex Suckleyana (Torr.); *Kochia dioica* Nutt. Gen. **1**: 200: not *Atriplex dioica* Raf.; *Endolepis Suckleyana* Torr. Pac. R. R. Rep. **12**: 47; *Atriplex Endolepis* Wats. Proc. Am. Acad. **9**: 110 [Man. R. M. 309].

MONTANA: Headwaters of the Yellowstone, *Suckley* in Stevenson's Exped.; Fort Maginnis, 1882, *Canby;* Glendive, 1887, *J. H Sandberg;* Teton River, 1883, *Scribner, 225.*

Atriplex Nuttallii Wats. Proc. Am. Acad. 9: 116 [Man. R. M. 310; Ill. Fl. 1: 580].

Dry plains, up to an altitude of 2000 m.

Montana: Madison River, 1895, *Rydberg, 2625;* Great Falls, 1886, *F. W. Anderson;* Belt Creek, 1883, *Scribner, 224.*

Eurotia lanata (Pursh) Moq. Enum. Chenop. 81 [Man. R. M. 311; Ill. Fl. 1: 581; Bot. Cal. 2: 56; Wats. Rev. 121]; *Diotis lanata* Pursh, Fl. Am. Sept. 602.

On dry plains and hills, up to an altitude of 2000 m.

Montana: Melrose, 1895, *Shear, 361; Rydberg, 2114;* Great Falls, 1884, *Tweedy, 224.*

* **Corispermum villosum** Rydb. Bull. Torr. Bot. Club, 24: 191.

It differs from *C. hyssopifolium* in the longer villous pubescence, and the achenes, which almost lack the wing margins. On plains, at an altitude of about 1500 m.

Montana: Manhattan, 1895, *Rydberg, 2623;* Great Falls, 1886, *R. S. Williams, 410;* Billings, 1898, *Williams & Griffith;* Teton River, 1883, *Scribner, 226;* Musselshell River, 1882, *Canby.*

Salicornia herbacea L. Sp. Pl. Ed. 2: 5 [Man. R. M. 312; Ill. Fl. 1: 582; Bot. Cal. 2: 57; Wats. Rev. 124]; *Salicornia Europaea herbacea* L. Sp. Pl. 3.

In salt marshes, at an altitude of about 1000 m.

Montana: Mouth of White River, Sept., 1860, *F. V. Hayden;* Teton River, 1883, *Scribner, 230.*

Sarcobatus vermiculatus (Hook.) Torr. Emory's Rep. 150 [Man. R. M. 312; Ill. Fl. 1: 584; Bot. Cal. 2: 59; Wats. Rev. 86]; *Batis vermiculata* Hook. Fl. Bor. Am. 2: 128.

In alkaline soil, up to an altitude of 1500 m.

Montana: Ruby River, 1887, *Tweedy, 277;* Great Falls, 1886, *R. S. Williams, 411;* Belt Creek, 1883, *Scribner, 227.*

Dondia depressa erecta (Wats.) Heller, Cat. N. A. Pl. 3; *Suaeda depressa erecta* Wats. Proc. Am. Acad. 9: 90 [Man. R. M. 312; Bot. Cal. 2: 58].

Alkali flats, up to an altitude of 1500 m.

Montana: Musselshell River, 1896, *Flodman, 406;* Helena, 1887, *Kelsey; Geyer;* Hinsdale, 1889, *Dr. V. Havard;* Crow Agency, 1871, *Hayden;* Teton River, 1883, *Scribner, 228* and *229;* Gallatin, 1882, *Canby.*

* **Salsola Tragus** L. Sp. Pl. Ed. 2: 322 [Ill. Fl. **1**: 586]: *Salsola Kali Tragus* Moq. in DC. Prodr. $\mathbf{13}^2$: 187.

The so-called Russian Thistle has also found its way into Montana, where it grows in old fields at an altitude of 1500 m.

MONTANA: Manhattan, 1895, *Rydberg, 2624.*

Kochia Americana Wats. Proc. Am. Acad. **9**: 93 [Man. R. M. 307; Bot. Cal. **2**: 45].

On the foothills and plains, up to an altitude of 2500 m.

MONTANA: Beaver Head Co., 1888, *Tweedy, 49.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 260.*

AMARANTHACEAE.

Amaranthus retroflexus L. Sp. Pl. 991 [Man. R. M. 304; Ill. Fl. **1**: 587: Bot. Cal. **2**: 41].

In old fields and waste places, at an altitude of 1000 m.

MONTANA: Sand Coulee, 1886, *R. S. Williams, 543:* Jefferson Valley, 1871, *B. Platt.*

Amaranthus blitoides Wats. Proc. Am. Acad. **12**: 273 [Man. R. M. 305; Ill. Fl. **1**: 588: Bot. Cal. **2**: 41].

In waste places and roads, up to an altitude of 1500 m.

MONTANA: Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 3951:* Great Falls, 1886, *R. S. Williams, 669:* Yellowstone River, 1882, *Canby;* Fort Benton, 1883, *Scribner, 222.*

Amaranthus graecizans L. Sp. Pl. 990 [Ill. Fl. **1**: 588]: *Amaranthus albus* L. Sp. Pl. Ed. 2: 1404 [Man. R. M. 304: Bot. Cal. **2**: 41].

In old fields, up to an altitude of 1000 m.

MONTANA: Great Falls, 1886, *R. S. Williams, 545:* Fort Logan, 1882, *Canby.*

NYCTAGINACEAE.

Allionia linearis Pursh, Fl. Am. Sept. 728 [Ill. Fl. **1**: 596]; *Oxybaphus angustifolius* Sweet, Hort. Brit. 429 [Man. R. M. 302].

On dry hills and plains, up to an altitude of 1500 m.

MONTANA: Billings, 1898, *Williams & Griffith.*

* **Allionia albida** Walt. Fl. Car. 84 [Ill. Fl. **1**: 595].

Like *Allionia linearis* Pursh, but the leaves are broader and the stem more pubescent above. In valleys, up to an altitude of 1500 m.

MONTANA: Fridley, Park Co., 1887, *Tweedy, 175:* Sand Coulee, 1885, *R. S. Williams, 283:* Lewis & Clarke Co., 1894, *E. Douglas;* Gallatin, 1882, *Canby;* Bull Mountain, 1882, *Canby.*

Abronia fragrans Nutt.; Hook. Kew Journ. Bot. **5**: 261 [Man. R. M. 302; Ill. Fl. **1**: 597].

On prairies, up to an altitude of 1500 m.

MONTANA: Rochester Creek, 1888, *Tweedy, 122.*

Abronia micrantha (Torr.) Chois.; DC. Prod. **13**²: 436 [Man. R. M. 303; Ill. Fl. **1**: 597]; *Tripteridium micranthum* Torr. Frem. Rep. 96.

In sandy soil, up to an altitude of 2000 m.

MONTANA: Melrose, 1895, *Rydberg, 2630:* Beaver Head Co., 1888, *Tweedy, 121.*

*Abronia arenaria.

Glandular-puberulent throughout: stem 3–4 dm. long, decumbent, branched; petioles 2–4 cm. long; leaf blade 1.5–2 cm. long, oblong-elliptic, obtuse, rather thick, densely and minutely glandular-puberulent; peduncles 3–4 cm. long, strict; bracts generally five in number, membranous, 4–5 mm. long, oblong and acute; flowers greenish or yellowish white, numerous, about 1 cm. long, tubular-trumpet-shaped with a small limb, densely puberulent; fruit biturbinate, *i. e.*, tapering to both ends and narrowly rhombic in longitudinal section, with about 5 low and rounded crests, densely glandular-puberulent.

In the size and color of the flowers it resembles *A. micrantha*, but the fruit places it nearest *A. fragrans* and *A. pogonantha*, from which it differs in the small flowers and leaves and the pubescence. It somewhat resembles *A. elliptica* Nelson, but that plant is less pubescent and the fruit is described as quite different. *A. arenaria* grows on sandy beaches.

YELLOWSTONE PARK: Mouth of Pelican Creek, 1885, *Tweedy, 442.*

PORTULACACEAE.

Oreobroma Grayi (Britt.); *Calandrinia pygmaea* Gray, Proc. Am. Acad. **8**: 623 [Man. R. M. 38: Bot. Cal. **1**: 75] not Muell.; *Talinum pygmaeum* Gray, Amer. Jour. Sci. **33**: 407; *Calandrinia Grayi* Britton, Bull. Torr. Bot. Club, **17**: 312; *Oreobroma pygmaea* Howell, Erythea, **1**: 33; *Lewisia pygmaea* Robinson; A. Gray, Syn. Fl. **1**¹: 268.

Dry ridges in gravel, at an altitude of 2800 m. or more.

MONTANA: Old Hollowtop, Pony Mountains, July 7, 1897, *Rydberg & Bessey, 3969;* Mountains, near Indian Creek, July 22, *3956;* Mill Creek, 1887, *Tweedy, 228;* Lake Plateau, 1897, *P. Koch;* Little Belt Mts., 1883, *Scribner, 14.*

YELLOWSTONE PARK: 1883, *Mary Compton;* 1884, *Tweedy, 13.*

IDAHO: Mt. Chauvet, July 27, 1897, *Rydberg & Bessey, 3968.*

Oreobroma Nevadensis (Wats.) Howell, Erythea, **1**: 33; *Calandrinia Nevadensis* A. Gray, Proc. Am. Acad. **8**: 623 [Man. R. M. 38; Bot. Cal. **1**: 75]; *Lewisia Nevadensis* Robinson: A. Gray, Syn. Fl. **1**^{1}: 268.

Alpine regions, at an altitude of 3000 m. or more.

MONTANA: Yogo, 1888, *R. S. Williams, 770.*

***Spraguea multiceps** Howell, Erythea, **1**: 39; *Spraguea umbellata caudicifera* A. Gray, Syn. Fl. **1**^{1}: 278; *S. umbellata* Coulter, Man. R. M. 39, in part (?).

Like *S. umbellata*, but the caudex branching, each branch bearing a rosulate tuft of thick leaves and a solitary almost naked scape with a globular glomerate inflorescence. In sandy soil, especially on the geyser-formations, at an altitude of 2000–2500 m.

MONTANA: Gallatin Co., *Mrs. Alderson;* Mill Creek, 1887, *Tweedy, 176;* Lake Plateau, 1897, *P. Koch, 36* and *60.*

YELLOWSTONE PARK: 1885, *C. W. Letterman*, Upper Geyser Basin, Aug. 6 and 8, 1897, *Rydberg & Bessey, 3983* and *3984;* Lower Basin, Aug. 4, *3982;* Yellowstone Lake, 1884, *Tweedy, 12;* 1871, *Hayden;* Stinking Water, 1873, *Parry, 44.*

***Claytonia Virginica** L. Sp. Pl. **1**: 204 [Syn. Fl. **1**^{1}: 271; Ill. Fl. **2**: 3].

Like *C. Caroliniana*, but the leaves linear-lanceolate or linear and the flowers larger. On hillsides, in rich moist soil, at an altitude of 2000–3000 m.

MONTANA: Bridger Mountains, June 11 and 12, 1897, *Rydberg & Bessey, 3972, 3973;* Electric Peak, Aug. 20, *3975;* Bozeman, 1892, *W. T. Shaw;* Dear Lodge, *Miss Emma Ware;* Wolf Butte, 1892, *R. S. Williams, 43;* Virginia City, *Dr. J. D. Heald.*

Claytonia lanceolata Pursh, Fl. Am. Sept. 175 [Syn. Fl. **1**^{1}: 271]; *Claytonia Caroliniana sessilifolia* Torr. Pac. R. R. Rep. **4**: 70 [Man. R. M. 38; Bot. Cal. **1**: 76].

In similar situations as the preceding and often growing with it.

Montana: Bridger Mountains, June 12 and 15, 1897, *Rydberg & Bessey*, *3970*, *3971* and *3974;* Lake Plateau, 1897, *P. Koch*, *60:* Upper Marias Pass, 1883, *Canby*, *55;* Bozeman, 1883, *Scribner*, *14a.*

Yellowstone Park: Swan Lake, 1885, *Tweedy*, *424;* Yellowstone Lake, 1871, *Hayden.*

Claytonia megarrhiza (Gray) Parry; Wats. Bibl. Ind. 118 [Syn. Fl. I¹: 272; Man. R. M. 39]; *Claytonia arctica megarrhiza* Gray, Am. Journ. Sc. (II.) **33**: 406.

In rocksides on the highest mountains, at an altitude of 2800 m. or more.

Montana: Mountains near Indian Creek, July 22, 1897, *Rydberg & Bessey*, *3976:* Gallatin Co., 1886, *Tweedy*, *1096;* Upper Marias Pass, 1883, *Canby*, *53.*

Montia asarifolia (Bong.) Howell, Erythea, **1**: 39 [Syn. Fl. I¹: 273]: *Claytonia asarifolia* Bong. Veg. Sitch. 137; *C. cordifolia* Wats. Proc. Am. Acad. **17**: 365 [Man. R. M. 38].

In springy places in the mountains of western Montana.

Montana: *Lyall;* Missoula, *Watson;* Coeur d'Alenes, 1891, *Kelsey.*

Montia Chamissonis (Ledeb.) Greene, Fl. Fran. 180 [Syn. Fl. I¹: 275]; *Claytonia Chamissoi* Ledeb.; Spreng. Syst. **1**: 790; *C. Chamissonis* Esch.; Cham. Linnaea, **6**: 562 [Man. R. M. 38: Bot. Cal. **1**: 76; Ill. Fl. **2**: 3].

In water or swampy places, at an altitude of 1000–2500 m.

Montana: Deer Lodge, 1895, *Rydberg*, *2632.*

Yellowstone Park: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey*, *3977;* head of Gibbon River, 1884, *Tweedy*, *14;* Yellowstone Lake, 1871, *Hayden.*

Montia perfoliata (Donn) Howell, Erythea, **1**: 38 [Syn. Fl. I¹: 274]; *Claytonia perfoliata* Donn, Hort. Cant. 25 [Man. R. M. 38; Bot. Cal. **1**: 75; Ill. Fl. **2**: 4].

In springy places, at an altitude of 2000–2500 m.

Montana: Bridger Mountains, June 10, 1897, *Rydberg & Bessey*, *3981;* Natural Bridge, Boulder River, 1897, *P. Koch*, *62.*

* **Montia depressa** (A. Gray): *Claytonia parviflora depressa* A. Gray, Proc. Am. Acad. **22**: 281: *Montia parviflora depressa* Robinson; A. Gray, Syn. Fl. **1**: 274.

Like the last, but smaller, depressed and with much smaller flowers, the calyx being only about 2 mm. long. On hillsides.

MONTANA: Gallatin Co., 1892, *Mrs. Alderson.*

* **Montia parviflora** (Dougl.) Howell, Erythea, **1**: 38 [Syn. Fl. **1**^{1}: 275]; *Claytonia parviflora* Dougl.: Hook. Fl. Bor. Am. **1**: 225: *Claytonia perfoliata parviflora* Torr. Pac. R. R. Rep. **4**: 71 [Bot. Cal. **1**: 75].

Stem diffuse or procumbent, more or less flagelliform: basal leaves rhombic-ovate; upper leaves very small, distant, subclavate when fresh. Moist rocks.

MONTANA: Lake Terry, 1892, *R. S. Williams, 870:* Jocko River, 1883, *Canby, 51:* Jefferson City, *Scribner, 14c.*

* **Montia linearis** (Dougl.) Greene, Fl. Fran. 181 [Syn. Fl. **1**^{1}: 276]; *Claytonia linearis* Dougl.: Hook. Fl. Bor. Am. **1**: 224 [Bot. Cal. **1**: 76].

In wet ground, especially around springs, at an altitude of 1000–2500 m.

MONTANA: Spanish Basin, June 26, July 1, 1897, *Rydberg & Bessey, 3978* and *3979;* Electric Peak, Aug. 20, *3980:* Highwood, 1888, *R. S. Williams, 771:* Bozeman Pass, 1883, *Canby, 52;* Loto Creek Cañon, 1880, *Watson.*

Lewisia rediviva Pursh, Fl. Am. Sept. 368 [Syn. Fl. **1**^{1}: 267; Man. R. M. 39; Bot. Cal. **1**: 78].

The "Bitter-root" grows on dry hills among gravel and rocks, at an altitude of 2000–3000 m.

MONTANA: Mountains near Indian Creek, July 22, 1897, *Rydberg & Bessey, 3955:* Spanish Basin, June 22 and 26, *3954* and *4259:* Beaver Head Co., *F. Tweedy, 132:* Helena, 1891, *Kelsey:* Silver Bow Co., *Mrs. Caspar: Mrs. Moore:* Beaver Head Co., 1888, *Tweedy, 132:* Bozeman, 1883, *Canby, 56:* Jefferson City, 1883, *Scribner, 14b.*

YELLOWSTONE PARK: 1883, *Miss Mary Compton;* Mammoth Hot Springs, 1885, *Tweedy, 421:* Yellowstone Lake, 1871, *Hayden;* Bannock City, 1880, *Watson.*

CARYOPHYLLACEAE.

* **Agrostemma Githago** L. Sp. Pl. 435 [Syn. Fl. 1^1: 228; Ill. Fl. 2: 7].

The well-known "Corn Cockle" is sparingly introduced in the State.

Montana: Helena, 1892, *Kelsey*; Madison Co., *Mrs. Flora McNulty*.

Silene antirrhina L. Sp. Pl. 419 [Syn. Fl. 1^1: 215; Man. R. M. 32: Ill. Fl. 2: 11; Bot. Cal. 1: 63].

On prairies in the eastern part of the State.

Montana: Big Horn River.

Silene acaulis L. Sp. Pl. Ed. 2, 603 [Syn. Fl. 1^1: 216; Man. R. M. 32: Ill. Fl. 2: 8].

On tops of the higher mountains, at an altitude of about 3000 m. or more.

Montana: Spanish Peaks, 1896, *Flodman, 411*: Old Hollowtop, Pony Mts., July 7 and 9, 1897, *Rydberg & Bessey, 3985* and *3986*; Wisconsin Creek, 1892, *J. B. Allebaugh*: Lone Mountain, 1886, *Tweedy, 1151*; Lake Plateau, 1897, *P. Koch*; McDonald's Peak, 1883, *Canby, 37*; Belt Mountains, *Scribner, 11a*; Odells, 1880, *Watson*.

Yellowstone Park: 1884, *Tweedy*.

* **Silene Oregana** Wats. Proc. Am. Acad. 10: 343 [Syn. Fl. 1^1: 220].

Capsule stipitate and calyx cylindric-clavate, as in the next species, but the petals divided into 4 or 6 linear segments.

Montana: Forks of the Madison, July 26, 1896, *Rydberg & Bessey, 3993*; Missoula, 1880, *Watson, 46*; Big Blackfoot, 1880, *Watson*.

Yellowstone Park: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 3992*; East DeLacy's Creek, *3990* and *3991*; Upper Geyser Basin, Aug. 8, *3995*; Lower Geyser Basin, *3994*.

* **Silene repens** Patrin; Pers. Syn. 1: 500 [Syn. Fl. 1^1: 221].

Stems several from a creeping rootstock, finely puberulent; calyx purple veined, narrowly turbinate-cylindric, narrowed downward; capsule decidedly stipitate; petals bifid. In rocky places in the valleys, at an altitude of 2000 m.

Montana: Bozeman Cañon, 1895, *Rydberg, 2635*; Spanish

Basin, 1896, *Flodman*, *412* and *413*; 1897, *Rydberg & Bessey*, *3987*; Pony Mts., July 7 and *9*, *3988*, *3989*.

Silene Douglasii Hook. Fl. Bor. Am. **1**: 88 [Syn. Fl. **1**^{1}: 222; Man. R. M. 32; Bot. Cal. **1**: 66].

This species is generally tall and slender, the calyx somewhat narrowed downward. It is rather rare in Montana.

Montana: Helena, 1891, *Kelsey*; Jocko Cañon, 1880, *Watson*.

Silene multicaulis Nutt.; Torr. & Gray, Fl. **1**: 192 [Man. R. M. 32]; *Silene Douglasii* var. *multicaulis* Robinson; Gray, Syn. Fl. **1**^{1}: 223.

Generally lower than the preceding, the calyx cylindric, and often somewhat more inflated at the base. It is common in valleys and on hillsides, up to an altitude of 2500 m.

Montana: Bridger Mountains, 1896, *Flodman*, *418*; Spanish Basin, *416*; Elk Mts., *414* and *419*; Little Belt Mts., *415* and *417*; Electric Peak, Aug. 18, 1897, *Rydberg & Bessey*, *3996*; Indian Creek, July 22, *3997*; Jack Creek, July 15, *3998*; Cedar Mountain, July 16, *3999*; Trout Creek, 1891, *R. S. Williams*, *124*; Gallatin Co., 1886, *Tweedy*, *1153*; East Boulder, 1887, *40*; Upper Marias Pass, 1883, *Canby*, *38*; Belt Mountains, *Scribner*, *11*.

Yellowstone Park: 1884, *Tweedy*, *287* and *288*.

Idaho: Mt. Chauvet, July 28 and 29, 1897, *Rydberg & Bessey*, *4000*, *4001* and *4002*.

***Silene Lyallii** Wats. Proc. Am. Acad. **10**: 342; *Silene Douglasii* var. *Macounii* Robinson: Gray, Syn. Fl. **1**^{1}: 223; *S. Macounii* Wats. Proc. Am. Acad. **26**: 124.

Like the last but still smaller, only 1–1.5 dm. high: leaves narrowly oblanceolate or linear: calyx very short, its teeth purple-tipped. It grows on the tops of the higher mountains, at an altitude of 3000 m.

Montana: Long Baldy, Little Belt Mts., 1897, *Flodman*, *420* and *421*; Bozeman, 1892, *Mrs. Alderson* (?).

Silene Scouleri Hook. Fl. Bor. Am. **1**: 88 [Syn. Fl. **1**^{1}: 224; Man. R. M. 32].

Valleys and hillsides in the southern and southwestern part of the State, at an altitude of 2000–2500 m.

Montana: Otter Creek, 1885, *F. W. Anderson*, *51*.

Silene Menziesii Hook. Fl. Bor. Am. **1**: 90 [Ill. Fl. **2**: 13: Syn. Fl. **1**^{1}: 219; Man. R. M. 32; Bot. Cal. **1**: 63].

Among bushes, at an altitude of 1000–1800 m.

MONTANA: Manhattan, 1895, *Rydberg, 2633;* Melrose, *2634;* Northern Montana, *F. W. Anderson;* Silver Bow Co., *Mrs. Moore;* Bitter Root Valley, 1880, *Watson.*

Lychnis Drummondi (Hook.) Wats. Bot. King's Exp. **5**: 37 [Ill. Fl. **2**: 15; Syn. Fl. **1**^{1}: 225; Man. R. M. 33]; *Silene Drummondi* Hook. Fl. Bor. Am. **1**: 89.

On hills in the plain region, and ascending the valleys to an altitude of 2000 m.

MONTANA: Lima, 1895, *Rydberg, 2636;* Deep Creek, 1891, *R. S. Williams, 141;* Bozeman Pass, 1883, *Canby, 35.*

YELLOWSTONE PARK: Pebble Creek, 1885, *Tweedy, 762.*

* **Lychnis apetala** L. Sp. Pl. 437 [Ill. Fl. **2**: 15; Syn. Fl. **1**^{1}: 226].

Distinguished from *L. Kingii* and *L. montana* by the nodding flower and the calyx inflated in fruit. In alpine regions, at an altitude of nearly 3000 m.

MONTANA: Upper Marias Pass, 1883, *Canby, 36.*

Vaccaria Vaccaria (L.) Britton; Britt. & Br. Ill. Fl. **2**: 18; *Saponaria Vaccaria* L. Sp. Pl. 409 [Syn. Fl. **1**^{1}: 213; Man. R. M. 31]: *Vaccaria vulgaris* Host, Fl. Aust. **1**: 518.

In waste places, cultivated soil and sandy hillsides.

MONTANA: Pony, July 8, 1897, *Rydberg & Bessey, 4003;* Bozeman, 1887, *Tweedy, 39;* Cottonwood Creek, 1892, *W. T. Shaw;* Madison Co., *Mrs. McNulty;* Sheridan, *Mrs. L. A. Fitch;* Custer Co., 1892, *Mrs. Light;* Sixteen Mile Creek, 1883, *Scribner, 10.*

ALSINACEAE.

Alsine Baicalensis Coville, Cont. U. S. Nat. Herb. **4**: 70; *Stellaria umbellata* Turcz, Bull. Soc. Nat. Mosc. **1838**: 89 [Syn. Fl. **1**^{1}: 233; Man. R. M. 33; Bot. Cal. **1**: 67]; not *Alsine umbellata* Lam.

In wet rich soil, at an altitude of 2000–3000.

MONTANA: Yogo, 1888, *R. S. Williams, 759;* Park Co., 1887, *Tweedy, 42;* Stillwater Cañon, *44* (a depauperate form).

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4010;* Electric Peak, Aug. 18, *4011* and *4012;* Mt. Washborne, 1884, *Tweedy, 293;* Indian Creek, *291;* 1885, *760.*

Alsine longifolia (Muhl.) Britton, Mem. Torr. Bot. Club, **5**: 150 [Ill. Fl. **2**: 22]; *Stellaria longifolia* Muhl.: Willd. Enum. Hort. Ber. 479 [Syn. Fl. **I**^{1}: 233: Man. R. M. 34].

In wet meadows, up to an altitude of 2000 m.

MONTANA: Melrose, 1895, *Rydberg, 2640:* Elk Mts., near Black Hawk, 1896, *Flodman, 428:* Little Rocky Mts., 1889, *V. Havard:* Spanish Basin, June 28, 1897, *Rydberg & Bessey, 4004;* Lewis and Clarke Co., *Mrs. Estella Muth:* Anaconda, 1892, *Kelsey;* Gallatin Co., 1887, *Tweedy, 43.*

Alsine longipes (Goldie) Coville, Cont. U. S. Nat. Herb. **4**: 70 [Ill. Fl. **2**: 23]; *Stellaria longipes* Goldie, Edinb. Phil. Journ. **6**: 327 [Syn. Fl. **I**^{1}: 233: Man. R. M. 34: Bot. Cal. **I**: 68].

In rich wet soil in the valleys, and on mountain sides up to an altitude of 2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 427:* Helena, 1892, *Kelsey:* Bozeman and Salesville, 1892, *W. T. Shaw;* Silver Bow Co., *Mrs. Moore:* Loto Creek Cañon, 1880, *Watson:* Grasshopper Valley, *Watson.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 289;* East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4005.*

Alsine laeta (Richards.): *Stellaria laeta* Richards. Frank. 1st Journ. App. 738 (Rep. 10): *S. longipes laeta* Wats. Bibl. Ind. 112 [Syn. Fl. **I**^{1}: 234: Man. R. M. 34].

Remarkable for its glaucous herbage, and in the living state easily distinguished from the preceding. In wet places on mountain sides, often near the snow, at an altitude of 3000–3200 m.

MONTANA: Gallatin Co., 1886, *F. Tweedy, 1150:* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 4008:* Pony, July 7 and 9, *4006* and *4007;* Spanish Peaks, 1896, *Flodman, 429.*

YELLOWSTONE PARK: Bison Peak, 1885, *Tweedy, 761.*

* **Alsine borealis alpestris** (Fries) Britton, Mem. Torr. Bot. Club, **5**: 150 [Ill. Fl. **2**: 24]; *Stellaria alpestris* Fries, Mant. **I**: 10: *Stellaria borealis corollina* Fenzl; Ledeb. Fl. Ross. **I**: 382 [Syn. Fl. **I**^{1}: 235].

Taller than the typical *S. borealis*, with broader leaves, and the upper bracts more or less scarious.

YELLOWSTONE PARK: 1884, *Tweedy, 292.*

* **Alsine Americana** (Porter); *Stellaria dichotoma Americana* Porter: Robinson, Proc. Am. Acad. **29**: 289 [Syn. Fl. **I**^{1}: 237].

A glandular-pubescent plant, low and caespitose, with the leaves crowded at the summit, resembling somewhat the Asiatic *A. dichotoma*, but differing in the broadly ovate acute leaves, the obtuse sepals and the longer narrow petals which are about twice as long as the sepals. It resembles a *Cerastium* more than an *Alsine* in general habit. Among rocks, at an altitude of 3000 m. or more.

MONTANA: Virginia City, 1871, *W. B. Platt:* Lone Mountain, 1886, *Tweedy, 1152;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4032;* Bridger Mts., June 15, *4033*.

Alsine crassifolia (Ehrh.) Britton, Mem. Torr. Bot. Club, **5**: 150 [Ill. Fl. **2**: 24]: *Stellaria crassifolia* Ehrh. Hannov. Mag. **8**: 116 [Syn. Fl. **1**^{1}: 235; Man. R. M. 34].

Mountain sides in wet places, at an altitude of about 3000 m.

MONTANA: Little Belt Mts., 1896, *Flodman, 431;* Fort Logan, 1882, *Canby*.

* **Alsine crispa** (Cham. & Schl.) Holz. Cont. U. S. Nat. Herb. **3**: 216; *Stellaria crispa* Cham. & Schlecht. Linnaea, **1**: 51 [Syn. Fl. **1**^{1}: 236].

Stems numerous and weak, glabrous; leaves ovate, commonly crisped on the edge; sepals lanceolate, longer than the acute capsule. In wet places, on mountain sides, at an altitude of 2500–3000 m.

MONTANA: Spanish Basin, 1896, *Flodman, 430;* Bridger Mts., June 14, 1897, *Rydberg & Bessey, 4014;* East DeLacy's Creek, Aug. 10, *4013;* Belt Mts., 1886, *R. S. Williams, 490;* Marysville, *Mrs. Muth*.

* **Alsine calycantha** (Ledeb.) Rydb. Bull. Torr. Bot. Club, **24**: 244; *Arenaria calycantha* Ledeb. Mem. Acad. St. Petersb. **5**: 534; *Stellaria calycantha* Bong. Veg. Sitch. 127 [Syn. Fl. **1**: 236].

Like the last, but more or less puberulent and with a subglobose obtuse pod. On mountain sides in wet places, at an altitude of 2000–3000 m.

MONTANA: Bozeman Cañon, 1895, *Rydberg, 2641;* Long and Yogo Baldy, Little Belt Mts., 1896, *Flodman, 432*.

* **Alsine obtusa** (Engelm.) Rose, Cont. U. S. Nat. Herb. **3**: 569; *Stellaria obtusa* Engelm. Bot. Gaz. **7**: 5.

Resembling the two preceding; glabrous, with obtuse pod and sepals. In wet places in the mountains.

MONTANA: Belt Mts., 1886, *F. W. Anderson, 57*.

Cerastium longipedunculatum Muhl. Cat. 46 [Ill. Fl. **2**: 26]; *Cerastium nutans* Raf. Prec. Decouv. 36 [Syn. Fl. **1**^{1}: 230; Man. R. M. 33; Bot. Cal. **1**: 66].

In lowlands, up to an altitude of 2200 m.

MONTANA: Elk Mts., 1896, *Flodman, 422:* Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 4015:* Spanish Basin, July 1, *4016:* West Gallatin, 1883, *Scribner, 12c.*

* **Cerastium brachypodum** Robinson, Proc. Am. Acad. **29**: 277 [Syn. Fl. **1**^{1}: 229; Ill. Fl. **2**: 26].

Like the preceding, but smaller and with the pedicels shorter and not hooked. Rare.

MONTANA: Great Falls, 1891, *R. S. Williams, 278.*

* **Cerastium elongatum** Pursh, Fl. Am. Sept. 321.

This species has been lost for over eighty years. When the larger part of the Lewis collection was discovered a few years ago in the possession of the American Philosophical Society at Philadelphia, the type of this species was found therein: this collection is now deposited with the Academy of Natural Sciences, where I have had the privilege of seeing it. The plant differs from *C. arvense* in the dense glandular-pubescence of the stem and especially of the inflorescence and calyx, and in the elongated raceme or panicle-like cyme with its nearly erect branches. It grows on hillsides, at an altitude of about 2000 m. The following specimens belong here:

MONTANA: Spanish Basin, 1897, *Rydberg & Bessey, 4017:* Little Belt Mts., 1896, *Flodman, 426½.*

Cerastium arvense L. Sp. Pl. 438 [Syn. Fl. **1**^{1}: 230: Man. R. M. 33; Ill. Fl. **2**: 27; Bot. Cal. **1**: 67].

Common in the valleys, up to an altitude of 2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 424:* Little Belt Mts., *423;* Spanish Basin, June 28 and 30, 1897, *Rydberg & Bessey, 4018;* Bridger Mts., June 11–18, *4021* and *4022*; Melrose, 1895, *Rydberg, 2637;* Bozeman, *2639;* Great Falls, 1891, *R. S. Williams, 32;* Basin, 1892, *F. D. Kelsey:* Missoula Co., *Mrs. J. J. Kennedy;* Bozeman, 1892, *W. T. Shaw:* Custer Co., 1892, *Mrs. Light;* Jefferson City, 1883, *Scribner, 12:* Grasshopper Valley, 1880, *Watson.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 295:* 1882, *Miss Mary Compton;* Yellowstone Lake, 1871, *Hayden.*

***Cerastium arvense strictum** (L.); *Cerastium strictum* L. Sp. Pl. 439; *C. arvense latifolium* Fenzl; Ledeb. Fl. Ross. **1**: 412 [Syn. Fl. **1**^{1}: 230]; not *Cerastium latifolium* L.

Plant low, more pubescent; leaves short, 12–16 mm. long. Common in the alpine regions, at an altitude of 2500–3500 m.

MONTANA: Spanish Peaks, 1896, *Flodman, 425;* Little Belt Mts., *426;* Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 4019* and *4024;* Electric Peak, Aug. 18, *4026;* Cedar Mountain, July 16, *4023;* Lima, 1895, *Rydberg, 2638;* Madison Co., 1888, *Tweedy, 143;* Upper Marias Pass, 1883, *Canby, 41.*

YELLOWSTONE PARK: 1884, *Tweedy, 294;* 1883, *Miss Mary Compton.*

* **Cerastium arvense Fuegianum** Hook. f.; A. Gray, Bot. U. S. Expl. Exp. 119 [Syn. Fl. **1**^{1}: 231; Britt. & Holl. Bull. Torr. Bot. Club, **14**: 50].

Low; leaves thick, small and imbricated; flowers solitary or in 2–3-flowered cymes. On geyser formations and on dry mountains, at an altitude of 2500–3500 m.

YELLOWSTONE PARK: Lower Geyser Basin, 1879, *J. M. Coulter;* Electric Peak, Aug. 16, 1897, *Rydberg & Bessey, 4029* and *4030;* Lower Geyser Basin, Aug. 4, *4025.*

Cerastium alpinum L. Sp. Pl. 438 [Syn. Fl. **1**^{1}: 231; Man. R. M. 33; Ill. Fl. **2**: 27].

On exposed mountain tops, among rocks, at an altitude of 3000 m.

MONTANA: Mountains near Indian Creek, July 22, *Rydberg & Bessey, 4031;* Upper Marias Pass, 1883, *Canby, 40.*

Cerastium Behringianum Cham. & Schl. Linnaea, **1**: 62; *Cerastium alpinum* var. *Beeringianum* Regel, Bull. Soc. Nat. Mosc. **35**: 316 [Syn. Fl. **1**^{1}: 231; Man. R. M. 33].

Evidently a good species and nearer related to *C. arvense* than to *C. alpinum*, although the sepals are more like those of the latter.

Among rocks, at an altitude of 3000 m. or more.

MONTANA: Old Hollowtop, Pony Mts., July 7 and 9, 1897, *Rydberg & Bessey, 4027* and *4028.*

Sagina saginoides (L.) Britton, Mem. Torr. Bot. Club, **5**: 151 [Ill. Fl. **2**: 30].

Spergula saginoides L. Sp. Pl. 441: *Sagina Linnaei* Presl, Rel. Haenk. **2**: 14 [Syn. Fl. **1**^{1}: 249; Man. R. M. 36; Bot. Cal. **1**: 70].

Hillsides and mountain sides, in damp places, at an altitude of 2500–3000 m.

MONTANA: Long Baldy, Little Belt Mts., 1896, *Flodman*, *446*; Sweet Grass Cañon, *447*; Spanish Basin, July 1, 1897, *Rydberg & Bessey*, *4034*; Yogo, 1888, *R. S. Williams*, *493*.

YELLOWSTONE PARK: Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey*, *4037*; East De Lacy's Creek, Aug. 10, *4035* and *4036*; Swan Lake, 1885, *Tweedy*, *763*; Mud Springs, 1871, *Hayden*.

Arenaria subcongesta (Wats.) Rydb. Bull. Torr. Bot. Club, **24**: 244; *Arenaria Fendleri* var. *subcongesta* Wats. Bot. King's Exp. **5**: 40; *A. congesta* var. *subcongesta* Wats. Bot. Cal. **1**: 69 [Syn. Fl. **1**¹: 241; Man. R. M. 35; Bot. Cal. **1**: 69].

Common on hillsides, mountains and in dryer valleys, at an altitude of 2000–3000 m.

MONTANA: Spanish Basin, 1896, *Flodman*, *434* and *436*; Little Belt Pass, *435*; Spanish Basin, June 28, 1897, *Rydberg & Bessey*, *4053*; Bridger Mts., June 14, *4054*; Park Co., 1889, *Tweedy*, 1887, *48*; Silver Bow Co., *Mrs. Helen Dolman*; Madison Co., 1888, *Tweedy*, *141*; Belt Mts., 1891, *R. S. Williams*, *41*; West Gallatin, 1883, *Scribner*, *12b*.

YELLOWSTONE PARK: 1884, *F. Tweedy*, *286*; 1885, *765*; 1883, *Miss Mary Compton*; Hot Sulphur Springs, 1871, *Hayden*.

* Arenaria subcongesta lithophila.

More delicate; cyme few-flowered; leaves shorter and more setaceous.

This bears the same relation to *A. subcongesta* as the var. *nardifolia* does to *A. capillaris*, and has been mistaken for that variety.

It grows in crevices of rocks and in shallow dry soil on the mountain tops, at an altitude of about 3000 m.

MONTANA: Spanish Peaks, 1896, *Flodman*, *437*; Elk Mts., *434*; Little Belt Mts., *438*; Bridger Mts., June 11, 1897, *Rydberg & Bessey*, *4055*; Melrose, 1895, *Rydberg*, *2642*; Grasshopper Creek, 1888, *Tweedy*, *142*; Lake Plateau, 1897, *P. Koch*, *52*.

IDAHO: Mt. Chauvet, July 27, 1897, *Rydberg & Bessey*, *4056*.

Arenaria capillaris Poir.; Lam. Enc. **6**: 380 [Syn. Fl. **1**¹: 240].

Distinguished from the variety in being larger and glabrous and having straight leaves.

MONTANA: McDonald's Peak, 1883, *Canby*, *48*; Bitter Root Valley, 1880, *Watson*.

Arenaria capillaris nardifolia (Ledeb.) Regel, Bull. Soc. Nat. Mosc. **35**: 247 [Syn. Fl. **1**¹: 240; Man. R. M. 35]; *Arenaria nardifolia* Ledeb. Fl. Alt. **2**: 106.

Rare among rocks, at an altitude of 3000 m. It differs from the variety of the preceding species in the bracts, which are not scarious.

MONTANA: Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey, 4057.*

Arenaria Hookeri Nutt.; Torr. & Gray, Fl. N. Am. **1**: 178 [Syn. Fl. **1**¹: 242; Ill. Fl. **2**: 32]; *Arenaria Franklinii minor* Hook. & Arn. Bot. Beech. 326 [Man. R. M. 35].

Dry hills and plains; it may reach an altitude of 2000 m.

MONTANA: Cottonwood Creek, 1896, *Flodman, 439;* Livingston, 1889, *F. Tweedy;* Surprise Creek, 1888, *R. S. Williams, 760;* Shields River, 1883, *Scribner, 12 bis.*

* **Arenaria tenella** Nutt. Torr. & Gray, Fl. N. A. **1**: 179 [Syn. Fl. **1**¹: 244].

Stem very slender, 1 dm. high or less; leaves attenuate from a connate strongly ribbed base to a filiform apex; sepals acuminate and 3-ribbed.

YELLOWSTONE PARK: 1883, *Miss Mary Compton.*

Arenaria verna equicaulis A. Nelson, Bull. Torr. Bot. Club, **26**: 352; *Arenaria verna* var. *hirta* Wats. Bot. King's Exp. **5**: 41 [Syn. Fl. **1**¹: 246; Man. R. M. 35]: not *A. hirta* Wormsk.

In crevices of rocks, at an altitude of 2000–3000 m.

MONTANA: Spanish Peaks, 1896, *Flodman, 442;* Little Belt Pass, *440* and *440a;* Bridger Mts., June 12 and 15, 1897; *Rydberg & Bessey, 4048* and *4050;* Upper Sand Coulee, 1888, *R. S. Williams, 722;* Little Belt Mts., 1883, *Scribner, 12;* Grasshopper Cañon, 1880, *Watson;* Sweet Grass Cañon, 1895, *Flodman, 441;* Old Hollowtop, Pony Mts., July 9, 1897, *Rydberg & Bessey, 4049* and *4051.*

YELLOWSTONE PARK: Mt. Norris, 1885, *Tweedy, 767.*

* **Arenaria Rossii** Richards.; Frankl. 1st Journ. 738 [Syn. Fl. **1**¹: 246].

Resembling the last, but glabrous and closely tufted; leaves fleshy, 3-edged; sepals less attenuate, slightly fleshy and more indistinctly ribbed.

YELLOWSTONE PARK: 1884, *Tweedy, 290;* Soda Butte, 1885, *166.*

MONTANA: Upper Marias Pass, 1883, *Canby, 43.*

Arenaria Nuttallii Pax, Engl. Jahrb. **18**: 30 [Syn. Fl. **1**^{1}: 246]; *Arenaria pungens* Nutt.; Torr. & Gray, Fl. N. A. **1**: 179 [Man. M. 36; Bot. Cal. **1**: 69]: not Michx.

Among rocks, at an altitude of 2500–3500 m.

MONTANA: Bridger Mts., June 11 and 15, 1897, *Rydberg & Bessey*, *4045* and *4046;* Cedar Mountain, July 16, *4047;* East Boulder Plateau, 1887, *Tweedy*, *45;* Beaver Head Co., 1888, *Tweedy*, *144:* Upper Marias Pass, 1883, *Canby*, *42:* Bozeman, 1883, *Scribner*, *12a*.

YELLOWSTONE PARK: Mt. Norris, 1885, *Tweedy*, *768*.

Arenaria Sajanensis Willd.: Schlecht. Mag. Ges. Nat. Fr. Berl. **7**: 200 [Syn. Fl. **1**^{1}: 246]: *Arenaria obtusa* Torr. Ann. N. Y. Lyc. **2**: 170; *A. biflora* var. *obtusa* Wats. Bibl. Ind. 95 [Man. R. M. 36].

Common on the tops of the mountains, among rocks and gravel, at an altitude of 3000 m. or more.

MONTANA: Little Belt Mts., 1896, *Flodman*, *444* and *445:* Old Hollowtop, Pony Mts., July 7 and 9, 1897, *Rydberg & Bessey*, *4039*, *4040* and *4052:* East Boulder Plateau, 1887, *Tweedy*, *46:* Belt Mts., 1883, *Scribner*, *12:* Cutbank Creek, 1883, *Canby*, *45*.

* **Arenaria Sajanensis rigidula** (Fenzl) Robinson, Proc. Am. Acad. **29**: 305 [Syn. Fl. **1**^{1}: 247]; *Alsine biflora* var. *rigidula* Fenzl; Ledeb. Fl. Ross **1**: 355.

More tufted and flowering stems short: leaves erect, firm and closely imbricated. With the species.

MONTANA: Spanish Peaks, 1896, *Flodman*, *443*; Yogo, 1888, *R. S. Williams*, *758:* Lake Plateau, 1897, *P. Koch:* Old Hollowtop, July 7, *Rydberg & Bessey*, *4041:* Ft. Ellis to Yellowstone, 1871, *Hayden*.

YELLOWSTONE PARK: 1884, *Tweedy*, *288:* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey*, *4044*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *4043*.

Arenaria Sajanensis carnosula (Fenzl) Robinson, Proc. Am. Acad. **29**: 305; *Alsine biflora carnosula* Fenzl; Ledebour, Fl. Ross. **1**: 355; *Arenaria biflora carnosula* Wats. Bibl. Ind. 94 [Man. R. M. 36].

MONTANA: East Boulder Plateau, 1887, *Tweedy*, *47:* Wisconsin Creek, 1892, *H. M. Fitch*.

YELLOWSTONE PARK: Hoodoo Peak, 1897, *P. Koch*, *7*.

Moehringia lateriflora (L.) Fenzl, Verbr. Alsin. table, p. 18 [Ill. Fl. **2**: 35]; *Arenaria lateriflora* L. Sp. Pl. 423 [Syn. Fl. **1**^{1}: 238; Man. R. M. 36].

Among bushes and on hillsides, up to an altitude of 2500 m.

MONTANA: Bridger Mts., June 10, 1897. *Rydberg & Bessey, 4038;* Lewis and Clarke Co., *Mrs. Muth;* Helena, 1891, *Kelsey;* Jefferson River, 1883, *Scribner, 12;* Ross' Hole, 1880, *Watson.*

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy, 769.*

* **Tissa rubra perennans** (Kindb.) Greene, Pittonia, **2**: 229: *Lepigonum rubrum perennans* Kindb. Monog. 40; *Spergularia perennans* Robinson; Gray, Syn. Fl. **1**^{1}: 250.

A somewhat fleshy plant, with narrowly linear leaves, large lanceolate scarious silvery stipules and small reddish flowers. In gravelly soil.

MONTANA: Granite, 1892, *F. D. Kelsey.*

ILLECEBRACEAE.

Paronychia sessiliflora Nutt. Gen. **1**: 160 [Man. R. M. 303; Ill. Fl. **2**: 39].

On dry hills, up to an altitude of 2000 m.

MONTANA: Little Rocky Mts., 1889, *Dr. V. Havard;* Madison River, 1886, *F. Tweedy, 1081;* Great Falls, 1891, *R. S. Williams, 282;* Beaver Head Co., 1888, *Tweedy, 140:* Fort Logan, 1882, *Canby;* 1883, *Scribner, 221.*

NYMPHAEACEAE.

Nymphaea polysepala (Engelm.) Greene, Bull. Torr. Bot. Club, **15**: 84; *Nuphar polysepalum* Engelm. Trans. Acad. St. Louis, **2**: 282 [Man. R. M. 13; Syn. Fl. **1**^{1}: 77: Bot. Cal. **1**: 17].

Growing in ponds and still pools in the rivers, up to an altitude of a little over 2000 m.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey, 4059;* Forks of the Madison, July 27, *4058;* Rimini, 1887, *F. D. Kelsey.*

YELLOWSTONE PARK: Headwaters of Gibbon River and Yellowstone Lake, 1884, *F. Tweedy, 28.*

Nymphaea advena Ait. Hort. Kew **2**: 226 [Ill. Fl. **2**: 42]; *Nuphar advena* Ait. Hort. Kew. Ed. 2, **3**: 295 [Syn. Fl. **1**^{1}: 77; Man. R. M. 12].

This is much rarer in the region than the preceding; I have seen only one specimen that could be referred to it.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 869.*

CERATOPHYLLACEAE.

Ceratophyllum demersum L. Sp. Pl. 992 [Ill. Fl. **2**: 46; Man. R. M. 328; Bot. Cal. **2**: 78].

In running water, up to an altitude of 2500 m.

YELLOWSTONE PARK: Broad Creek, 1885, *Tweedy, 407.*

RANUNCULACEAE.

Caltha leptosepala DC. Syst. **1**: 310 [Syn. Fl. **1**^{1}: 40: Man. R. M. 6; Bot. Cal. **1**: 9].

In swamps, at altitudes of 2000–3000 m.

MONTANA: Grizzly Creek, 1887, *Tweedy, 188;* Deer Lodge Co., *Mrs. Jennie Moore:* Granite, 1892, *F. D. Kelsey:* Head of Stillwater, 1897, *P. Koch, 76.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall:* 1885, *Tweedy, 911:* 1892, *Brandegee:* Upper Falls, 1871, *Hayden.*

Trollius albiflorus (Gray); *Trollius laxus albiflorus* Gray, Am. Journ. Sci. II. **33**: 241 [Man. R. M. 9].

This Rocky Mountain plant, as far as I can ascertain, has always white flowers, and broader sepals and broader lobes to the leaves than *T. laxus.* Although these characters seem unimportant, I am fully of the opinion that *T. albiflorus* is distinct from its Eastern relative. The pure white and broader sepals are not confined to the low plants near the snow banks, but are also found on those growing in swampy places in the valleys. It occurs at an altitude of 2000–3500 m.

MONTANA: Deer Lodge, 1889, *F. W. Traphagen:* Old Hollowtop, Pony Mountains, July 7, 1897, *Rydberg & Bessey, 4060:* Spanish Peaks, 1895, *Flodman, 450:* Park Co., 1887, *Tweedy, 181;* Silver Bow Co., *Mrs. Jennie Moore:* Belt Park, 1886, *R. S. Williams, 487;* Lake Plateau, 1897, *P. Koch, 43:* Belt Mountains, 1883, *Scribner, 5.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall:* East De Lacy's Creek, Aug. 10, 1896, *Rydberg & Bessey, 4061:* 1885, *Tweedy, 895;* 1883, *Miss Mary Compton:* 1896, *J. F. Kemp.*

* **Coptis occidentalis** (Nutt.) Torr. & Gray, Fl. N. A. **1**: 28 [Syn. Fl. **1**^{1}: 41; Bot. Cal. **2**: 427]; *Chrysocoptis occidentalis* Nutt. Journ. Acad. Phil. **7**: 8.

A small plant having 3-foliolate leaves with long-petiolate rounded 3-lobed leaflets, small greenish or greenish white flowers, and stipitate carpels. It is a rare plant within the region.

MONTANA: (Western), 1882, *Tweedy*.

Actaea rubra (Ait.) Willd. Enum. 561 [Ill. Fl. **2**: 55]; *Actaea spicata rubra* Ait. Hort. Kew. **2**: 221 [Syn. Fl. **1**^{1}: 55; Man. R. M. 12].

The eastern plant has cherry-red ellipsoid berries, which are about 10–12 mm. long and 6 mm. in diameter, containing 8–12 seeds. The leaflets are narrower than in the western plants and less incised. The only specimen I have seen from Montana which could be referred to *A. rubra* is the following:

MONTANA: Belt Mts., 1885, *F. W. Anderson, 18*.

Actaea arguta Nutt.; Torr. & Gray, Fl. **1**: 35; *Actaea spicata arguta* Torr. Pac. R. R. Rep. **4**: 63 [Syn. Fl. **1**^{1}: 55; Man. R. M. 11; Ill. Fl. **2**: 55; Bot. Cal. **1**: 12].

Under this two different forms have been included: one with nearly spherical small red berries, 5–7 mm. long, and seeds about 3 mm. long; the other with white, ellipsoid berries, nearly twice as large as those of the other form. Nuttall describes the berries of *A. arguta* as being small, spherical and red. The two grow in the same region and often together, and are very hard to distinguish when in flower, but are readily separated when in fruit. *A. arguta* grows in open woods at an altitude of 1000–2500 m.

MONTANA: Bridger Mts., 1896, *Flodman, 449;* Meadow Creek, 1886, *Tweedy, 1064;* Missoula Co., *Mrs. Kennedy;* Bozeman, 1892; *W. T. Shaw;* Helena, 1886, *F. D. Kelsey;* Anaconda, 1891, *Prof. Merritt;* Emigrant Gulch, 1897, *Rydberg & Bessey, 4063a.*

*Actaea eburnea.

Perennial, with a rather thick knotted rootstock; stem stout, 6–10 dm. high, with large membranaceous, rounded-obtuse sheaths at the base, glabrate or the upper portion villous-puberulent; leaves ternate or the lower twice ternate, the divisions pinnate; leaflets broadly ovate, often 3–5-lobed, incised and sharply serrate, acuminate; raceme ovoid, in fruit elongated; bracts linear-lanceolate, 5–8 mm. long; pedicels 0.5–1 cm. long, in fruit 1–2 cm., mostly ascending; sepals orbicular, early deciduous; petals narrowly rhombic-spatulate, acute, 3–4 mm. long; filaments 4–5 mm. long; fruit white, ellipsoid, 9–12 mm. long and about 6 mm. in diameter, about 12-seeded; seeds obliquely pear-shaped, triangular, with a rounded back, about 4 mm. long.

In the size and form of the fruit and the form of the petals it resembles closely *A. rubra*, but the berries are perfectly white, the plant taller, the leaflets broader and more acuminate and the teeth are sharper. In general habit it more resembles *A. arguta*, from which it differs in the color and the size of the fruit and somewhat also in the form of the petals. It grows in rich woods, at an altitude of 1000–2500 m.

MONTANA: Bridger Mountains, June 18, 1897, *Rydberg & Bessey, 4062;* Emigrant Gulch, August 23, *4063;* Anaconda, 1891, *Prof. Merritt;* Jefferson City, 1883, *Scribner, 8a;* Bridger Cañon, 1896, *Flodman, 448*.

Aquilegia Jonesii Parry, Am. Nat. 8: 211 [Syn. Fl. **1**¹: 43; Man. R. M. 10].

A small plant growing among exposed rocks, at an altitude of 2500–3500 m.

MONTANA: Little Belt Pass, Aug. 10, 1896, *Flodman, 451;* East Boulder River, 1889, *F. Tweedy;* Yogo, 1888, *R. S. Williams, 764;* Upper Marias Pass, 1883, *Canby, 13*.

Aquilegia flavescens Wats. Bot. King's Exp. **5**: 10 [Syn. Fl. **1**¹: 43: Man. R. M. 10]; *Aquilegia Canadensis hybrida* Hook. Fl. Bor. Am. **1**: 24; not *A. hybrida* Sims.

Rather common in woods, at altitudes of 2000–3000 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 147;* Bear Gulch, Park Co., 1887, *189;* Spanish Basin, 1896, *Flodman, 453* and *454;* Madison Mountains, near Indian Creek, July 21, *Rydberg & Bessey, 4069;* Jack Creek Cañon, July 15, *4068;* Bridger Mts., June 11 and 17, *4066* and *4067;* Bozeman, 1895, *Rydberg, 2646;* Gallatin Co., *Mrs. Hodgeman;* Missoula Co., *Mrs. Kennedy;* Sun River, 1887, *R. S. Williams, 685;* Wisconsin Creek, 1892, *Mrs. Fitch;* Upper Marias Pass, 1883, *Canby, 14;* Bozeman, *14;* Belt Mts., *Scribner, 6*.

YELLOWSTONE PARK: 1884, *Tweedy, 300;* 1883, *Miss Mary Compton;* Hot Sulphur Springs, 1871, *Hayden;* 1873, *C. C. Parry, 2*.

* **Aquilegia leptocera** Nutt. Journ. Acad. Phil. **7**: 9; *Aquilegia coerulea albiflora* Gray, Syn. Fl. **1**¹: 44.

Perhaps scarcely more than a variety of *A. coerulea*, but is regarded as a distinct species by several recent botanists; it differs from *A. coerulea* mainly in its white flowers, which are occasionally slightly tinged with blue. It grows on mountain sides at altitudes of 2500–3000 m.

MONTANA: Lima, 1895, *Rydberg, 2644;* Beaver Head Co., Sweetwater Basin, 1888, *Tweedy, 148;* Bear Gulch, 1887, *190;* Terminus, 1880, *Watson.*

Aquilegia formosa Fischer; DC. Prod. **1**: 50 [Syn. Fl. **1**^{1}: 44; Man. R. M. 10].

Next to *A. flavescens* this is the most common columbine in Montana, growing in woods at an altitude of 1000–2500 m.

MONTANA: Lima, 1895, *Rydberg 2645;* Spanish Basin, 1896, *Flodman, 452;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 4070.*

Delphinium scopulorum Gray, Pl. Wright. **2**: 9 [Syn. Fl. **1**^{1}: 11; Man. R. M. 11; Bot. Cal. **2**: 428].

The typical *D. scopulorum* is a more southern plant, growing from New Mexico and Arizona to Utah and Nevada. I refer the following specimens to it doubtfully; they have the deeply dissected leaves of *D. scopulorum* but are taller and more strict, approaching the next species in habit:

MONTANA: Lima, 1895, *Rydberg, 2647* (?); Beaver Head Co., 1888, *Tweedy, 145* (?).

* **Delphinium glaucum** Wats. Bot. Cal. **2**: 427; *Delphinium scopulorum glaucum* Gray, Syn. Fl. **1**^{1}: 47.

Nearest related to *D. scopulorum*, but much taller, often 1–2 m. high; its leaves are larger, glaucous-green, less dissected and with broad segments. It is the most common species in Montana, growing in rich soil, at an altitude of 1500–2500 m.; it is poisonous to cattle and together with *D. bicolor* has caused considerable loss to cattlemen.

MONTANA: Bozeman, 1889, *Mrs. Alderson;* Spanish Basin, 1896, *Flodman, 455;* Bozeman, 1895, *Rydberg, 2648;* Mill Creek, 1887, *Tweedy, 184;* Sixteen Mile Creek, 1883, *Scribner, 8.*

YELLOWSTONE PARK: 1884, *Tweedy, 306.*

IDAHO: Henry's Lake, July 31, 1896, *Rydberg & Bessey, 4079.*

* Delphinium glaucescens.

Stems from a thick perennial caudex, 3–5 dm. high, somewhat angled, finely pubescent especially above, or in age glabrate, more or less glaucous; leaves rather firm, finely puberulent, more or less glaucous, orbicular in outline, divided to near the base into 5–8 cuneate divisions, these generally deeply 3-cleft; raceme simple, rather short; lower bracts linear, about 2 cm. long and exceeding the flowers, the upper subulate; pedicels and flowers densely and finely pilose: flowers dark blue, sometimes variegated with white, somewhat nodding on the spreading pedicels; spur straight, about 1 cm. long, equalling and in a straight line with the lower sepals; upper petals yellowish white, tipped and tinged with blue: ovaries densely hairy: fruit not seen.

The plant resembles a small *D. glaucum*, especially in the form of the leaves. It differs in the shorter and more pilose inflorescence, the darker flowers, the lower and more tufted habit of the plant, and the densely hairy ovaries. *D. glaucum* grows in rich soil in meadows or open woodlands, while this species is found among rocks at an altitude of nearly 3000 m.

YELLOWSTONE PARK: Electric Peak, August 18, 1897, *Rydberg & Bessey*, *4078* (type).

MONTANA: Cedar Mountain, July 16, *Rydberg & Bessey*, *4077*.

* Delphinium glaucescens multicaule.

Stems several from a much branched caudex or rootstock, about 2 dm. high, almost glabrous, striate and many-leaved below: leaves round in outline, divided to the base into 5–7 divisions, these generally twice cleft into linear lobes, which are usually diverging and somewhat curved: raceme simple, about 5 cm. long: bracts linear-subulate; spreading pedicels and the flowers finely glandular pilose: flowers very dark blue: spur stout, scarcely 1 cm. long, generally hooked at the end, or with a small more or less curved projection; ovaries finely pubescent.

It closely resembles the species, but is much more bushy and less pubescent: the segments of the leaves longer and much narrower; the flowers smaller and the spur generally curved. It grows in rock-slides, at an altitude of about 3000 m.

MONTANA: Cedar Mountain, July 16, 1897, *Rydberg & Bessey*, *4071*.

Delphinium bicolor Nutt. Journ. Acad. Phil. **7**: 10 [Syn. Fl. **1**^{1}: 48; Man. R. M. 11].

The typical *D. bicolor* is rather glabrate, as described by Gray and Coulter, but it frequently grades into the following variety. It grows at an altitude of 2000–3000 m.

MONTANA: Little Belt Pass, 1896, *Flodman*, *456*: Spanish Basin, *457*: Grizzly Creek, 1887, *Tweedy*, *185*: Flat Head River, *Nuttall*: *Wyeth*: Spanish Basin, June 26, 1897, *Rydberg & Bessey*, *4076a*; Bridger Mountains, June 12, *4074*: June 15, *4072*: Custer Co., 1892, *Mrs. Light*: Upper Marias Pass, 1883, *Canby*, *15*.

YELLOWSTONE PARK: Mammouth Hot Springs, 1885, *Tweedy, 897;* 1888, *Dr. Chas. H. Hall.*

*Delphinium bicolor Montanense.

Glandular-pilose throughout; leaves thicker.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Beaver Head Co., 1888, *Tweedy, 33;* Hell Gate, *John Pearsall, 851;* Bozeman, 892, *W. T. Shaw;* Helena, 1891, *Kelsey;* Butte, 1896, *J. F. Kemp;* Spanish Basin, June 26, 1897, *Rydberg & Bessey, 4076;* Bridger Mts., June 14, *4073;* June 12, *4074;* Indian Creek, July 22, *4075.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1889, *F. W. Dewart.*

Delphinium Menziesii DC. Syst. **1**: 355 [Syn. Fl. **1**^{1}: 50; Man. R. M. 11].

Exceedingly like the preceding, and I strongly doubt its being really distinct. The only feature that seems to distinguish it, especially from the variety, is the cluster of more or less tuberous roots, while *D. bicolor* has a stout many-branched perennial root or stock. *D. Menziesii* is a rarer plant, confined to the higher mountains, at an altitude of 2500 m. or more.

MONTANA: Lima, 1895, *Rydberg, 2649;* Beaver Head Co., 1888, *Tweedy, 33a;* Boulder River, Jefferson Co., *22;* Grafton, 1892, *R. S. Williams, 2;* Shields River, 1883, *Scribner, 7a;* Bannock, 1880, *Watson;* Grasshopper Valley, *Watson.*

* **Delphinium simplex** Dougl.; Hook. Fl. Bor. Am. **1**: 25 [Syn. Fl. **1**^{1}: 49; Bot. Cal. **1**: 10].

It somewhat resembles the two preceding, but is taller, often 1 m. high, strict, and with a spiciform long virgate raceme. It is a rather rare plant.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 34.*

YELLOWSTONE PARK: 1885, *Tweedy, 896* (?).

Aconitum Columbianum Nutt.; Torr. & Gray, Fl. N. Am. **1**: 34 [Syn. Fl. **1**^{1}: 52; Man. R. M. 11]; *Aconitum Fisheri* Wats. Bot. Cal. **1**: 12; not Reich.

In moist ground, at an altitude of about 2500 m.

MONTANA: Lo Lo Creek, 1880, *Watson.*

YELLOWSTONE PARK: Buisquit Geyser Basin, Aug. 6, 1897, *Rydberg & Bessey, 4080;* East De Lacy's Creek, Aug. 10, *4081;* 1884, *Tweedy;* 1890, *F. D. Kelsey;* Yellowstone Lake, 1871, *Hayden.*

Anemone parviflora Michx. Fl. Bor. Am. **1**: 319 [Syn. Fl. **1**^{1}: 10: Man. R. M. 4; Ill. Fl. **2**: 62].

On the tops of the higher mountains at an altitude of 2500–3200 m.

Montana: Park Co., 1889, *F. Tweedy:* Little Belt Mts., 1896, *Flodman, 458:* Bozeman, 1887, *F. Tweedy, 187:* Sun River, 1887, *R. S. Williams, 684:* Upper Marias Pass, 1883, *Canby, 5.*

* **Anemone Tetonensis** Porter, Ann. N. Y. Acad. Sci. **6**: 224 [Syn. Fl. **1**^{1}: 10].

It is nearest related to the next and *A. Hudsoniana*, but differs in the smaller and deep purple flowers, and the less pubescent leaves with blunter lobes. Among rocks on the mountain sides, at an altitude of 2000–3000 m.

Montana: Bridger Mts., 1896, *Flodman, 461:* Little Belt Mts., *459:* Spanish Peaks, *460;* Old Hollowtop, Pony Mts., July 7, 1891, *Rydberg & Bessey, 4083:* Cedar Mts., July 16, *4082.*

Idaho: Mt. Chauvet, near Henry's Lake, July 29, 1897, *Rydberg & Bessey, 4084.*

Anemone globosa Nutt.: Pritzel, Linnaea, **15**: 673; *Anemone multifida globosa* Pritzel, l. c.; *Anemone multifida* Brewer & Wats. Bot. Cal. **1**: 4 [Man. R. M. 4]: not Poir.

Anemone multifida Poir. is a South American species, growing in Patagonia and Terra del Fuego, differing from its North American allies in the coarse hirsute pubescence. In the United States it is represented by two distinct forms, one northeastern, *A. Hudsoniana* Richardson, and one from the Rocky Mountains, *A. globosa.* The former has the small flowers of *A. multifida* and *A. Tetonensis*, differing from *multifida* mainly in the pubescence and from the latter in the very narrow segments of the leaves. *A. globosa* differs from all three in the large flowers, the sepals being often 1 cm. long or more. The segments of the leaves are much broader than in *A. Hudsoniana* and the pubescence looser, being often quite long silky-villous. The type represents a specimen with a single long-peduncled flower and less hairy leaves; the same form is also represented by *Rydberg & Bessey, 4085* and *4086;* this form can not, however, be separated from the common one with several peduncles. *A. globosa* varies in color from greenish or yellowish white to dark purplish red. It grows in valleys, at an altitude of 1500–3000 m.

Montana: Helena, 1890, *F. D. Kelsey:* Little Belt Mts., 1896, *Flodman*, *463;* Bridger Mts., *462;* Spanish Basin, *464;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey*, *4087* and *4092½;* Bridger Mts., June 11, *4088*, *4089*, *4090* and *4092;* Jack Creek, July 14 and 15, *4085* and *4086;* Bozeman, 1882, *Tweedy;* Madison Co., *Mrs. Flora McNulty;* Gallatin Co., *Mrs. Alderson;* Helena, 1891, *F. D. Kelsey;* West Gallatin, 1883, *Scribner*, *1c;* McDonald's Peak, 1883, *Canby*, *6;* Shinberger's Cañon, 1880, *Watson;* Hell Gate, *Watson*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1889, *F. W. Dewart;* 1884, *Tweedy*, *304;* 1885, *899*.

Anemone cylindrica Gray, Ann. Lyc. N. Y. **3**: 221 [Man. R. M. 4; Syn. Fl. **1**^{1}: 10; Ill. Fl. **2**: 63].

On creek banks and in open woods, up to an altitude of 2000 m.

MONTANA: North Mill Creek, 1887, *Tweedy*, *186;* Gallatin Co., *Mrs. Hodgeman;* Alhambra, 1892, *F. D. Kelsey;* Bitter Root Valley, 1880, *Watson*.

YELLOWSTONE PARK: 1893, *Miss Mary Compton*.

* **Pulsatilla occidentalis** (Wats.) Freyn, Deutsche Bot. Monatschr. 8: 78; *Anemone occidentalis* Wats. Proc. Am. Acad. **11**: 121 [Bot. Cal. **1**: 3].

Characterized by its petioled bracts and its thin white or purplish spreading sepals. Rare in Montana.

MONTANA: Upper Marias Pass, *Canby*, *4*.

Pulsatilla hirsutissima (Pursh) Britton, Ann. N. Y. Acad. Sci., **6**: 217 [Ill. Fl. **2**: 67]; *Clematis hirsutissima* Pursh, Fl. Am. Sept. 385; *Anemone Nuttalliana* DC. Syst. **1**: 193; *Anemone patens Nuttalliana* Gray, Man. Ed. 5, 36 [Syn. Fl. **1**^{1}: 9; Man. R. M. 3].

Common on hills, at an altitude of 1000–3000 m.

MONTANA: Dear Lodge, 1888, *F. W. Traphagen;* Madison Co., 1888, *Tweedy*, *146;* Old Hollowtop, Pony Mts., July 9, 1897, *Rydberg & Bessey*, *4094;* Indian Creek, July 21, *4093;* Bridger Mts., June 17, *4095;* Bozeman, 1882, *Tweedy;* Mt. Blackmore, 1886, *1063;* Hell Gate, *John Pearsall*, *837;* Gallatin Co., *Miss Carrie Shipman;* Butte, 1896, *J. F. Kemp;* Helena, 1892, *F. D. Kelsey;* Bozeman Pass, 1883, *Scribner*, *1b*.

YELLOWSTONE PARK: East Fork, 1885, *Tweedy*, *900;* Mammoth Hot Springs, 1889, *F. W. Dewart*.

Clematis ligusticifolia Nutt.; Torr. & Gray, Fl. N. Am. **1**: 9 [Syn. Fl. 1^1: 4; Man. R. M. 3; Ill. Fl. **2**: 68; Bot. Cal. **1**: 3].

This species belongs to the cañons of the great plains and "bad lands," but ascends in the mountains to an altitude of 2000 m.

MONTANA: Bozeman, 1886, *Tweedy*, *1059;* Crow Creek, 1894, *E. Douglass;* Salesville and West Gallatin, 1892, *W. T. Shaw;* Lewis & Clarke Co., *Mrs. Muth:* Helena, *F. D. Kelsey:* Belt Mountains, 1883, *Scribner*, *1;* Missoula, 1880, *Watson.*

Clematis Douglasii Hook. Fl. Bor. Am. **1**: 1 [Syn. Fl. 1^1: 8; Man. R. M. 3].

Common in open woods throughout the mountain regions up to an altitude of almost 3000 m.

MONTANA: Bozeman, 1883, *Scribner*, *1a;* Helena, 1895, *Rydberg*, *2651;* Bridger Mountains, June 12–18, 1897, *Rydberg & Bessey*, *4096* and *4100;* Jack Creek Cañon, July 14, *401:* Old Hollowtop, Pony Mts., July 7, *4098:* Elk Mts., 1895, *Flodman*, *466;* Bozeman Pass, 1882, *F. Tweedy;* Hell Gate, *John Pearsall*, *876:* Helena, 1891, *F. D. Kelsey:* Lewis & Clarke Co., *Mrs. Muth;* Gallatin Co., *Mrs. Alderson:* Bozeman, 1892, *W. T. Shaw:* Belt Mts., 1891, *R. S. Williams*, *111:* Clear Water Creek, 1883, *Canby*, *3.*

YELLOWSTONE PARK: Obscidian Cliffs, 1888, *Dr. Chas. H. Hall* (together with a form with narrowly linear lobes); 1885, *Tweedy*, *892:* Mammoth Hot Springs, 1889, *F. W. Dewart.*

IDAHO: Beaver Cañon, 1895, *Rydberg*, *2650;* Henry's Lake, July 27, 1897, *Rydberg & Bessey*, *4099.*

Clematis Scottii Porter: Porter & Coulter, Syn. Fl. Colo.; *Clematis Douglasii Scottii* Coult. Man. Bot. Rocky Mts. 3 [Syn. Fl. 1^1: 8; Ill. Fl. **2**: 70].

Rare in Montana, growing on hillsides at an altitude of 2000 m.

MONTANA: Spanish Basin, 1896, *Flodman*, *465;* Bozeman, 1883, *Canby*, *2.*

Atragene Columbiana (Torr. & Gray) Nutt. Jour. Acad. Philad. **7**: 7; *Clematis Columbiana* Torr. & Gray, Fl. N. Am. **1**: 11; *Clematis verticilaris Columbiana* Gray, Syn. Fl. 1^1: 8; *Clematis verticilaris* Wats. Bot. Cal. **1**: 3 [Man. R. M. 3, as to the Rocky Mountain plants]; not DC.

Common in the woods, at an altitude of 2000–3000 m.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Jack Creek, July 14, 1897, *Rydberg & Bessey*, *4104;* Bridger Mts., June 15 and

18, *4102* and *4103;* Bozeman, 1895, *Rydberg, 2653;* Bozeman, 1885, *Tweedy;* Deer Lodge, 1892, *W. T. Shaw;* Gallatin Co., *Mrs. Hodgman;* Ross' Hole, 1880, *Watson;* Bozeman, 1883, *Scribner, A.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 893;* 1889, *F. W. Dewart.*

Atragene occidentalis Hornem. Hort. Hafn. **1813**: 520; *Clematis alpina occidentalis* Gray, in Powell, Geol. Surv. Rep. Dakota, 531 [Syn. Fl. **1**^{1}: 8; Man. R. M. 3].

Among rocks. Only one specimen seen from the region.

MONTANA: Helena, 1882, *Tweedy.*

* **Atragene tenuiloba** (Gray) Britton, Bull. Herb. Boiss. **2**: 106; *Clematis alpina* var. *occidentalis* subvar. *tenuiloba* Gray, in Powell, Geol. Surv. Rep. Dakota, 531; var. *tenuiloba* Gray Syn. Fl. **1**^{1}: 9.

Like the last, but the leaflets dissected into narrow divisions; achenes hairy. It grows among rocks, at an altitude of 2000–3000 m.

MONTANA: Little Belt Pass, 1895, *Flodman, 267;* Helena, 1895, *Rydberg, 2652;* Lewis and Clarke Co., *Mrs. Muth;* Helena, 1892, *F. D. Kelsey.*

Myosurus minimus L. Sp. Pl. 284 [Syn. Fl. **1**^{1}: 19; Man. R. M. 5; Ill. Fl. **2**: 71; Bot. Cal. **1**: 5].

In dried pools and muddy places. Rare in the region, but common further east and south. It is sometimes rather hard to distinguish it from the following.

MONTANA: Silver Bow Co., *Mrs. Moore.*

* **Myosurus lepturus** (Gray) Howell, Fl. N. W. Am. **1**: 12; *Myosurus apetalus lepturus* Gray, Bull. Torr. Bot. Club, **13**: 2 [Syn. Fl. **1**^{1}: 19].

Differs from the preceding in the oblong achenes and elongated oblong seed. In *M. minimus* the achenes are more or less rhomboid on the back and the seeds are oval. Similar situations as the preceding, but more common.

MONTANA: Jack Creek Cañon, July 16, 1896, *Rydberg & Bessey, 4105;* Great Falls, 1888, *R. S. Williams 682.*

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 912.*

* **Trautvetteria grandis** Nutt.; Torr. & Gray, Fl. N. Am. **1**: 37 [Syn. Fl. **1**^{1}: 18; Bot. Cal. **2**: 425]; *Actaea grandis* Dietr. Syn. **3**: 233.

A plant 5–10 dm. high, with palmately divided leaves 1–3 dm. in diameter, less reticulated than in its eastern congener, *T. Carolinensis* (F. & M.) Vail. It is common on the Pacific Slope, but rare within the region.

YELLOWSTONE PARK: Lewis Lake, 1884, *Tweedy, 302.*

* **Ranunculus Purshii** Richards. in Frankl. 1st Journ. Ed. 2, App. 751 (Reprint 23) [Syn. Fl. **1**^{1}: 24; Ill. Fl. **2**: 73].

Resembles *R. multifidus*, but the leaves are smaller and with broader divisions, the achenes are without a turgid thickening at the base and the style is more slender and longer. It grows in pools and slow-running streams, up to an altitude of 2500 m.; it is often more or less hairy on the flaccid stem.

MONTANA: Deer Lodge, 1895, *Rydberg, 2654;* Bozeman, 1896, *Flodman, 468;* Electric Peak, Aug. 20, 1896, *Rydberg & Bessey, 4106;* Bozeman, 1887, *Tweedy, 197;* Helena, 1892, *F. D. Kelsey;* Belt River, 1888, *R. S. Williams, 766;* Little Prickly Pear Creek, 1883, *Scribner, 3.*

YELLOWSTONE PARK: Yellowstone Lake, 1885, *Tweedy, 908.*

* **Ranunculus hyperboreus** Rottboell, Act. Hafn. **10**: 458 [Syn. Fl. **1**^{1}: 25; Ill. Fl. **2**: 74].

Resembles somewhat *R. natans*, but is much smaller and grows in wet soil, not in the water. Its leaves are only 4–10 mm. in diameter and the petals about 2 mm. long. It is found only at an altitude of about 3000 m.

MONTANA: Old Hollowtop, Pony Mts., July 9, 1897, *Rydberg & Bessey, 4109;* Anaconda, 1892, *F. D. Kelsey.*

Ranunculus reptans L. Sp. Pl. 549 [Ill. Fl. **2**: 75]; *Ranunculus flammula reptans* E. Meyer, Pl. Lab. 96 [Syn. Fl. **1**^{1}: 27: Man. R. M. 6; Bot. Cal. **1**: 7].

Muddy or sandy shores of lakes and rivers, up to altitude of 2500 m.

MONTANA: Sun River, 1887, *R. S. Williams, 683.*

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 4107;* Yellowstone Lake, Aug. 12, *4108;* 1885, *Tweedy, 702.*

Ranunculus pygmaeus Wahl. Fl. Lapp. 157 [Syn. Fl. **1**^{1}: 29; Man. R. M. 7].

In damp places on alpine peaks.

MONTANA: Stillwater, 1887, *Tweedy, 199.*

* **Ranunculus alismellus** (Gray) Greene, Fl. Fran. 297; *Ranunculus alismaefolius alismellus* Gray, Proc. Am. Acad. **7**: 327 [Syn. Fl. **1**^{1}: 27; Bot. Cal. **1**: 6].

Like *R. alismaefolius*, but more slender; leaves thin, the lower oblong to ovate; petals about 6 mm. long. It grows at an altitude of 2000–2500 m.

MONTANA: Granite, 1892, *F. D. Kelsey;* Big Hole, 1880, *Watson.*

YELLOWSTONE PARK: 1888, *Dr. Chas H. Hall.*

* **Ranunculus ellipticus** Greene, Pittonia, **2**: 110.

Generally less than 1 dm. high, with elliptic entire basal leaves, deeply cleft stem leaves, globose heads and short styles. It grows at an altitude of 2000–2500 m. It is nearest related to *R. glaberrimus* Hook.

MONTANA: Bridger Mts., June 14, 1897, *Rydberg & Bessey, 4110;* Bozeman Pass, 1883, *Tweedy, 885;* Gallatin Co., *Mrs. Hodgman & Mrs. Alderson;* 1892, *W. T. Shaw;* Helena, 1889, *F. D. Kelsey;* Unionville, 1892, *F. D. Kelsey;* Clendenin, 1881, *R. S. Williams, 166;* Bozeman Pass, 1883, *Scribner, 4c;* Terminus, 1880, *Watson.*

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 907;* Mammoth Hot Springs, 1889, *F. W. Dewart.*

Ranunculus digitatus Hook. Journ. Bot. & Kew Misc. **3**: 124 [Syn. Fl. 29; Man. R. M. 8].

The roots are fascicled and tuberously thickened. It is a rare plant, growing at an altitude of about 2000 m.

YELLOWSTONE PARK: Mammoth Hot Springs, 1889, *F. W. Dewart; Burglehaus.*

* **Ranunculus Sabini** R. Br. in Parry's 1st Voy. Suppl. 264; Rydb. Bull. Torr. Bot. Club, **24**: 245.

Related to *R. pygmaeus*, but has larger flowers and hairy sepals. A very rare plant growing at an altitude of about 3000 m.

MONTANA: Long Baldy, Little Belt Mts., 1895, *Flodman, 469.*

* **Ranunculus Suksdorfii** Gray, Proc. Am. Acad. **21**: 371 [Syn. Fl. **1**^{1}: 30].

Belongs to the same group as *R. Eschscholtzii*, but has obovate petals which are 8–12 mm. long, subreniform-flabelliform basal leaves which are deeply divided into obcuneate divisions, and a small globular head of glabrous achenes with slender styles. It is an alpine plant growing at an altitude of 2500–3000 m.

MONTANA: Spanish Peaks, July 14, 1896, *Flodman, 471;* Old Hollowtop, Pony Mts., July 7 and 9, *Rydberg & Bessey, 4114;* Grizzly Creek, 1887, *Tweedy, 192a.*

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 909.*

* Ranunculus saxicola.

Stems about 1 dm. long, decumbent or ascending, glabrous. Basal leaves several, with petioles about 5 cm. long, ciliate; blade rounded or reniform-flabellate, somewhat hairy when young, pedately 3-cleft, the middle lobe narrow, entire or sometimes slightly 3-toothed, the lateral lobes very oblique, on the outside coarsely 3–4-toothed, stem leaves 1–3, subsessile, pedately 3–7-cleft into linear lobes; peduncle rather long for the size of the plant; flower 1–2 cm. in diameter; sepals tinged with brown, about half as long as the petals, very broad, obovate, obtuse, slightly villous-hairy; petals broadly obovate; head of achenes oblong, 5–10 mm. long; achenes more or less pubescent, tipped with a straight style, of nearly the same length.

Nearest related to *R. Suksdorffi*, from which it differs in the oblong head, the pubescent achenes, and a slight difference in the form of the leaves.

It grows among rocks, at an altitude of 3000 m.

MONTANA: Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4112* and *4113;* Mill Creek, 1887, *Tweedy, 192.*

YELLOWSTONE PARK: Electric Peak, August 18, 1897, *Rydberg & Bessey, 4111;* 1885, *Tweedy, 909;* Mt. Holmes, 1884, *301.*

Ranunculus alpeophilus A. Nelson, Bull. Torr. Bot. Club, **26**: 350; *Ranunculus Eschscholtzii* Gray, Syn. Fl. 1^1: 31 in part, not Schl.; *Ranunculus nivalis Eschscholtzii* Wats. Bot. King's Exp. **5**: 8 [Man. R. M. 7].

It differs from *R. Eschscholtzii* in being nearly glabrous, in its broader and less divided basal leaves and in the long (3–5 cm.) slender lobes of the upper leaves. Rare in this region, growing at an altitude of nearly 3000 m.

MONTANA: McDonald's Peak, 1883, *Canby, 9;* Grizzly Creek, 1887, *Tweedy, 191.*

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 905.*

Ranunculus pedatifidus J. E. Smith, Rees' Cyclop. no. 72 [Ill. Fl. **2**: 77]; *R. affinis* R. Br. Parry's 1st Voy. App. 265 [Syn. Fl. 1^1: 31; Man. R. M. 8, in part].

Rare in wet places on the higher mountains, at an altitude of 2500–3000 m.

MONTANA: Little Belt Mts., on Long and Yogo Baldy, 1896, *Flodman*, *470* and *470a;* 1883, *Scribner*, *4*.

* **Ranunculus inamoenus** Greene, Pittonia, **3**: 91; *Ranunculus affinis* Gray, Proc. Am. Acad. **21**: 371 [Syn. Fl. **1**^{1}: 31, mainly as to the Rocky Mountain plant; Man. R. M. 8].

The subarctic and alpine *R. affinis* R. Br. is a much smaller plant with deeper cleft basal leaves. *R. inamoenus* grows in rich soil and damp places in the mountain regions, at an altitude of 1500–2500 m.

MONTANA: Bozeman, 1892, *W. T. Shaw;* 1892, *Tweedy*, *115;* Elliston, 1890, *F. D. Kelsey;* Bridger Mts., June 14, 1897, *Rydberg & Bessey*, *4116;* Cedar Mountain, July 16, *4117;* Spanish Basin, June 26 and 30, *Rydberg & Bessey*, *4118* and *4119;* Deer Lodge, 1890, *F. D. Kelsey;* Belt Park, 1886, *R. S. Williams*, *720*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Mammoth Hot Springs, 1885, *Tweedy*, *910;* Bozeman, 1883, *Scribner*, *4a*.

Rununculus cardiophyllus Hook. Fl. Bor. Am. **1**: 14; *Ranunculus affinis validus* Gray, Proc. Am. Acad. **21**: 371 [Syn. Fl. **1**^{1}: 31]; *Ranunculus affinis cardiophyllus* Gray, Proc. Acad. Phila. **1863**: 56 [Man. R. M. 8]; *R. pedatifidus cardiophpllus* Britt. Bull. Torr. Bot. Club, **18**: 265 [Ill. Fl. **2**: 77].

In the Synoptical Flora this is said to grow in Montana, but no specimens have been seen from the state. It is common in the Black Hills of South Dakota and may be found in the southeastern part of Montana.

Ranunculus ovalis Raf. Proc. Dec. 36; *Ranunculus rhomboideus* Goldie, Edinb. Phil. Jour. **6**: 329 [Syn. Fl. **1**^{1}: 31; Man. R. M. 7; Ill. Fl. **2**: 77].

This is a plant of more eastern distribution and rare in Montana, where it has been found up to an altitude of 2000 m.

MONTANA: Bridger Mts., 1896, *Flodman*, *493*.

Ranunculus abortivus L. Sp. Pl. 551 [Syn. Fl. **1**^{1}: 32; Man. R. M. 7; Ill. Fl. **2**: 78].

This is also rare in Montana, reaching an altitude of 2000 m.

MONTANA: Helena, 1892, *F. D. Kelsey*; Bozeman, 1882, *Tweedy*, *114*; West Gallatin, *Scribner*, *4b*.

* **Ranunculus Douglasii** Howell, Fl. N. W. Am. **1**: 18, Mar., 1897; *R. arcuatus* Heller, Bull. Torr. Bot. Club, **24**: 310, June, 1897; *R. tenellus* Nutt.; T. & G. Fl. **1**: 23 [Syn. Fl. **1**¹: 33], not Viviani: *R. Nelsoni tenellus* Gray, Proc. Am. Acad. **8**: 374 [Bot. Cal. **1**: 8].

This and also the next differ from *R. occidentalis* in the small flowers. The stem is slender and glabrous. It grows in wet meadows, at an altitude of 2000–3000 m.

MONTANA: Bozeman, 1896, *Flodman*, *474*: Spanish Basin, *475*: June 26, 1897, *Rydberg & Bessey*, *4120* and *4121*; Bridger Mts., June 10–17, *4122*, *4123*, *4124* and *4125*; Bozeman Pass, 1883, *Canby*, *10*.

* **Ranunculus Lyallii** (Gray); *Ranunculus occidentalis Lyallii* Gray, Proc. Am. Acad. **21**: 373; *R. tenellus Lyallii* Robinson, Syn. Fl. **1**¹: 33: *R. Greenei* Howell, Fl. N. W. Am. **1**: 18.

Very closely related to the preceding and perhaps only a variety of it, differing mainly in the stouter hairy stem and broader segments of the leaves; it grows in similar situations and has about the same range.

MONTANA: Spanish Basin, 1896, *Flodman*, *476*; July 1, 1897, *Rydberg & Bessey*, *4128*; Bridger Mts., June 18, *4127*: Bozeman, 1895, *Rydberg*, *2655*: Lone Mt., 1886, *Tweedy*, *1062*; Belt Mts., 1886, *F. W. Anderson*, *12*.

Ranunculus occidentalis Nutt.; Torr. & Gray, Fl. N. A. **1**: 22 [Syn. Fl. **1**¹: 33]; *Ranunculus Nelsonii* Gray, Proc. Am. Acad. **8**: 374 [Man. R. M. 8].

A low plant, with ascending stems, and large oblong petals almost twice as large as the sepals. Very rare in the region.

MONTANA: Elk Mts., near Black Hawk, 1896, *Flodman*, *477*.

YELLOWSTONE PARK: 1883, *Miss Mary Compton*.

* Ranunculus Montanensis.

Stem stout, from fascicled fibrous roots, 3–5 dm. high, sparingly silky hirsute. Basal leaves silky hirsute all over, ternate, the divisions again divided or cleft into linear or lanceolate segments; the hirsute petioles 1 dm. or more long; stem leaves similar, but short-petioled: flowers few and very large: sepals broadly ovate, silky; petals broadly obovate, 7–10 mm. long; head of achenes globose; styles long, slender, and much curved.

It has been mistaken for *R. macranthus* on account of its large flowers, but that species has a straight style. Its style character would associate it with *R. occidentalis*, from which it is easily distinguished by the tall habit, the broad petals, and the long and narrow divisions of the leaves. In fact the habit is most like that of *R. acriformis*, from which it is distinguished by the larger flowers, the longer and finer hairs and the long and slender, not much flattened, strongly hooked style.

MONTANA: Deer Lodge Co., *Miss Emma Ware;* 1892, *W. T. Shaw;* Helena, 1891, *F. D. Kelsey* (type); Granite, 1892, *Kelsey*.

Ranunculus Pennsylvanicus L. f. Suppl. 272 [Syn. Fl. **1**^{1}: 35; Man. R. M. 8; Ill. Fl. **2**: 80].

Growing along streams; never found in the mountain regions proper, but ascends the valleys up to an altitude of about 2000 m.

MONTANA: East Gallatin Swamps, 1895, *Flodman, 478;* Bozeman, 1887, *Tweedy, 193;* Cottonwood Creek, 1892, *W. T. Shaw*.

* **Ranunculus Macounii** Britton, Trans. N. Y. Acad. Sci. **12**: 3 [Syn. Fl. **1**^{1}: 36; Ill. Fl. **2**: 80].

It much resembles *R. Pennsylvanicus*, but is generally stouter and lower and with a globose head of achenes which are about 3 mm. long. In *R. Pennsylvanicus* the head is cylindric and the achenes scarcely 2 mm. long. *R. Macounii* grows in damp places, ascending into the mountains to an altitude of 2500 m.

MONTANA: Madison Mts., near Indian Creek, July 22, 1897, *Rydberg & Bessey, 4131;* Forks of the Madison, July 26, *4130;* Spanish Basin, June 28, *4129;* 1896, *Flodman, 480;* East Gallatin Swamp, *479;* Bozeman, 1887, *Tweedy, 194;* Helena, 1888, *F. D. Kelsey;* Custer Co., 1892, *Mrs. Light;* Nevada Creek, 1883, *Canby*.

YELLOWSTONE PARK: Mammoth Hot Springs, *Tweedy, 903*.

* **Ranunculus eremogenes** Greene, Erythea, **4**: 121.

Like *R. sceleratus*, but leaves more dissected, stem comparatively leafless, herbage light green and flowers larger. In wet places, up to an altitude of 2500 m.

MONTANA: Helena, 1891, *F. D. Kelsey;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 4258a*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 901*.

* **Ranunculus orthorhynchus** Hook. Fl. Bor. Am. **1**: 21 [Syn. Fl. **1**^{1}: 38].

A tall plant somewhat resembling *R. macranthus*, but with smaller flowers and a slender straight beak as long as the achene. A rare plant.

Yellowstone Park: 1885, *Tweedy*.

Batrachium trichophyllum (Chaix) Bossch. Prod. Fl. Bat. 5 [Ill. Fl. **2**: 84]; *Ranunculus trichophyllus* Chaix; Vill. Hist. Pl. Dauph. **1**: 335: *Ranunculus aquatilis trichophyllus* Gray, Man. Ed. 5. 40 [Syn. Fl. **1**^{1}: 21: Man. R. M. 6, in part; Bot. Cal. **1**: 5]; var. *stagnatilis* Coulter, Man. R. M. 6.

In Coulter's manual the leaves are said to collapse when withdrawn from the water, which is seldom the case. *B. trichophyllum* seems to be described under the var. *stagnatilis*, while the next species is characterized as var. *trichophyllus*. *Ranunculus aquatilis stagnatilis* DC. (*R. circinatus* Sibth., *R. divaricatus* Schrank) has sessile leaves and large flowers and is, as far as I know, not found in Montana. *B. trichophyllum* grows in streams, up to an altitude of 2500 m.

Montana: Cliff Lake, Madison Co., July 27, 1897, *Rydberg & Bessey, 4133*; Bozeman, 1896, *Flodman, 481*: Deer Lodge, *Miss Emma Ware*; Helena, 1892, *F. D. Kelsey*: Sun River, 1883, *Scribner, 2*: Little Belt Mts., 1882, *Canby*.

Batrachium flaccidum (Pers.) Rupr. Fl. Cauc. 15: *Ranunculus flaccidus* Pers.; Usteri, Ann. Bot. **5**^{14}: 38; *Ranunculus aquatilis flaccidus* Gray, Syn. Fl. **1**^{1}: 21: var. *trichophyllus* Coulter, Man. R. M. 6.

In streams, up to an altitude of 2500 m. The stem is generally thicker than in the preceding, somewhat fleshy, and the divisions of the leaves very long and flabby.

Montana: Jack Creek, July 15, 1897, *Rydberg & Bessey, 4135*.

Yellowstone Park: 1885, *Tweedy, 906*: Mammoth Hot Springs, 1889, *F. W. Dewart*.

* **Batrachium confervoides** Fries, Bot. Not. **1845**: 121; *Ranunculus confervoides* Fries, Sum. Veg. Scand. **1**: 139: *Ranunculus aquatilis confervoides* Gray, Syn. Fl. **1**^{1}: 21.

The whole plant more delicate than the preceding; flowers very small, about 10 mm. in diameter, with few stamens; leaves filiform and flaccid, but not as long as in the preceding. In streams, at an altitude of 2500 m.

YELLOWSTONE PARK: Fire Hole River, near Lone Star Geyser, Aug. 7, 1897, *Rydberg & Bessey, 4134:* 1883, *Miss Mary Compton.*

* **Batrachium caespitosum** (DC.) F. Schultz, Arch. Fl. Fr. & All. **1**: 71; *Ranunculus aquatilis caespitosus* DC. Prod. **1**: 26 [Syn. Fl. **1**^{1}: 21].

Dwarf; leaves small, orbicular in outline, the segments somewhat fleshy, short and rather broad.

MONTANA: Northern Montana, 1883, *Canby, 8.*

Oxygraphis Cymbalaria (Pursh) Prantl; Engl. & Prantl, Nat. Pfl. Fam. **3**^{2}: 63 [Ill. Fl. **2**: 86]; *Ranunculus Cymbalaria* Pursh, Fl. Am. Sept. 392 [Syn. Fl. **1**^{1}: 23; Man. R. M. 6; Bot. Cal. **1**: 7].

In wet, more or less alkaline soil, up to an altitude of about 2000 m.

MONTANA: Jack Creek Cañon, July 15, 1897, *Rydberg & Bessey, 4132;* Bridger Mts., June 10, *4132½:* Fridley, 1887, *Tweedy, 198;* Great Falls, 1891, *R. S. Williams, 326;* Sheridan, 1892, *Edith Virden;* Gallatin Co., *Mrs. Alderson:* Bozeman, 1892, *W. T. Shaw;* Custer Co., 1892, *Mrs. Light;* West Gallatin, 1883, *Scribner, 4d.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1889, *F. W. Dewart.*

* **Thalictrum venulosum** Trelease, Proc. Bost. Soc. Nat. Hist. **23**: 302 [Syn. Fl. **1**^{1}: 16; Ill. Fl. **2**: 88].

Resembles somewhat *T. Fendleri* in habit, but is distinguished by the strong reticulation of the leaves, and by the achenes which are only slightly flattened and have comparatively firm walls. It is a plant of lower altitudes, scarcely reaching 2000 m.

MONTANA: East Gallatin Swamps, 1896, *Flodman, 485;* Bozeman, 1895, *Rydberg, 2657.*

Thalictrum occidentale Gray, Proc. Am. Acad. **8**: 372 [Syn. Fl. **1**^{1}: 16; Man. R. M. 5; Bot. Cal. **1**: 4 and **2**: 425].

Common in valleys and open woods, up to an altitude of 2500 m.

MONTANA: Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 4139;* Spanish Basin, 1896, *Flodman, 482;* Little Belt Mts., *483;* Bridger Mts., *484;* Bozeman, 1895, *Rydberg, 2656;* Gallatin Peak, 1886, *F. Tweedy, 1061;* Nobleville, 1892, *Mrs. Noble;* Bozeman Creek, 1892, *W. T. Shaw;* Lewis and Clarke Co., *Mrs. Muth;*

Gallatin Co., *Mrs. Alderson;* Helena, 1891, *F. D. Kelsey;* Bozeman, 1883, *Scribner, 1d:* Odells, 1880, *Watson:* Missoula, *Watson.*

* **Thalictrum megacarpum** Torr. in Frem. Rep. 87 (name): Trelease Proc. Bost. Soc. Nat. Hist. **23**: 303.

Resembles most *T. occidentale*, but the leaves are generally somewhat smaller and firmer; the achenes are broader, more flattened and oblique as in *T. Fendleri*, but somewhat longer. All specimens referred to *T. Fendleri* from Montana and northern Wyoming belong here; *T. Fendleri* is easily distinguished by the small leaflets and the short achenes. *T. megacarpum* grows with the preceding.

MONTANA: Bridger Mts., June 12, 1897, *Rydberg & Bessey, 4137:* Mountains near Indian Creek, July 21, 1897, *Rydberg & Bessey, 4136;* Jack Creek, July 14, 1897, *4138:* Spanish Basin, June 28, 1897, *4138½;* Bozeman, 1885, *Tweedy, 894:* Trail Creek, 1887, *Tweedy, 179:* Belt Mts., *F. W. Anderson, 7;* Highwood Cañon, 1888, *R. S. Williams, 737:* Columbia Falls, 1892, *R. S. Williams, 867;* McDonald's Peak, 1883, *Canby, 7.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 305:* Lake, 1893, *Addison Brown;* 1888, *Dr. Chas. H. Hall:* 1871, *Hayden.*

Thalictrum purpurascens L. Sp. Pl. 546 [Ill. Fl. **2**: 88: Syn. Fl. **1**^{1}: 17]; *Talictrum Cornuti* Hook. Fl. Bor. Am. **1**: 3 [Man. R. M. 5]; not L.

This species belongs to the prairie region, but extends in the river valleys up to an altitude of 2000 m.

MONTANA: Bozeman, 1886, *Tweedy, 1060;* Belt Creek, 1887, *R. S. Williams, 418.*

BERBERIDACEAE.

Berberis Aquifolium Pursh, Fl. Am. Sept. 219 [Ill. Fl. **2**: 90]; *Berberis repens* Lindl. Bot. Reg. *t. 1176* [Syn. Fl. **1**^{1}: 69; Man. R. M. 12; Bot. Cal. **1**: 14].

It is evident that Pursh's description and plate, except one leaflet, belong to what has generally been known as *B. repens* Lindl. Lindley made a mistake when he supposed that the name *B. Aquifolium* belonged to the tall shrub of the Pacific coast, and this mistake has been followed by most American authors.

B. Aquifolium grows on hillsides at an altitude of 1000–2500 m. The root is used as a medicine under the name of "Oregon Grape-root."

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Indian Creek, July 21, 1897, *Rydberg & Bessey, 4239;* Bridger Mts., June 12–18, *4240, 4241, 4242:* West Boulder, 1887, *F. Tweedy, 167;* Bozeman, 1882; Lewis & Clarke Co., *Mrs. Muth;* Gallatin Co., *Mrs. Alderson;* Helena, 1889, *F. D. Kelsey;* Bozeman, 1883, *Scribner, 8b;* Missoula, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: 1885, *Tweedy, 448.*

FUMARIACEAE.

Capnoides aureum (Willd.) Kuntze, Rev. Gen. Pl. 14; *Corydalis aurea* Willd. Enum. 740 [Syn. Fl. 1¹: 97; Man. R. M. 14; Ill. Fl. 2: 106].

When mature, the pod is pendulous and torulose or moniliform, *i. e.*, constricted between the seeds. On hillsides, up to an altitude of 2500 m.

MONTANA: Little Belt Mts., 1896, *Flodman, 486;* Torn Miner Creek, Park Co., 1887, *Tweedy, 117:* Sand Coulee, 1891, *R. S. Williams, 26;* Butte, 1886, *J. F. Kemp.*

YELLOWSTONE PARK: 1883, *Miss Mary Compton.*

Capnoides montanum (Engelm.) Britton, Mem. Torr. Bot. Club, 5: 166 [Ill. Fl. 2: 107]: *Corydalis montana* Engelm.; Gray, Mem. Am. Acad. 4: 6; *Corydalis aurea occidentalis* Engelm.; Gray, Man. Ed. 5, 62 [Man. R. M. 14; Bot. Cal. 1: 24].

Pod not torulose, mostly ascending or spreading. Distribution about the same as the preceding.

MONTANA: Deer Lodge, 1890, *F. D. Kelsey;* Lewis & Clarke Co., *Mrs. Muth;* Gallatin Co., *Mrs. Alderson;* Deer Lodge, 1892 *W. T. Shaw;* Jefferson City, 1883, *Scribner, 8c:* Ross' Hole, 1880, *Watson.*

YELLOWSTONE PARK: Yellowstone Lake, 1889, *Tweedy, 447.*

CRUCIFERAE.

Thelypodium torulosum Heller, Bull. Torr. Bot. Club, 25: 265; *Thelypodium sagittatum* (Nutt.) Endl.; Walp. Rep. 1: 172 [Syn. Fl. 1¹: 175: Man. R. M. 21; Bot. Cal. 1: 37], not (Nutt.) Heller; *Pachypodium sagittatum* Nutt.; Torr. & Gray, Fl. N. A. 1: 97.

Grows at an altitude of about 2500 m.

MONTANA: Grasshopper Valley, 1880, *Watson*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Pelican Creek, 1885, *Tweedy, 573;* 1883, *Miss Mary Compton.*

Thelypodium integrifolium (Nutt.) Endl.; Walp. Rep. **1**: 172 [Syn. Fl. **1**^{1}: 176: Man. R. M. 21; Ill. Fl. **2**: 110; Bot. Cal. **1**: 37]; *Pachypodium integrifolium* Nutt.; Torr. & Gray, Fl. N. A. **1**: 96.

On dry hills and plains, up to an altitude of 2000 m.

MONTANA: Fridley, 1887, *Tweedy, 24:* Helena, 1887, *R. S. Williams, 637;* Lewis & Clarke Co., *Mrs. Muth* (narrow leaved form); Madison River, 1882, *Canby;* Hell Gate, 1880, *Watson*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 207*.

Subularia aquatica L. Sp. Pl. 642 [Ill. Fl. **2**: 110: Man. R. M. 25; Syn. Fl. **1**^{1}: 130; Bot. Cal. **1**: 43].

In shallow pools, up to an altitude of 3000 m.

YELLOWSTONE PARK: Lake, 1873, *Parry, 27;* 1885, *Tweedy, 576*.

Stanlya viridiflora Nutt.; Torr. & Gray, Fl. N. A. **1**: 98 [Syn. Fl. 178; Man. R. M. 22: Bot. Cal. **1**: 38].

Rare in the region.

MONTANA: Red Rock Creek, 1888, *Tweedy, 51:* Shinberger's Cañon, 1880, *Watson*.

* **Lepidium integrifolium** Nutt.: Torr. & Gray, Fl. N. A. **1**: 116 [Syn. Fl. **1**^{1}: 125].

A plant with a thick root, entire oblong or spatulate thick leaves, 25–50 mm. long, white broadly clawed petals, 2 stamens, and obovate-oblong pod with a distinct style.

MONTANA: Muddy River, on Upper Missouri, *Geyer*, according to Hooker.

Lepidium sativum L. Sp. Pl. 644 [Syn. Fl. **1**^{1}: 126; Man. R. M. 26; Ill. Fl. **2**: 112].

Introduced around dwellings.

MONTANA: Helena, 1888, *F. D. Kelsey*.

* **Lepidium ramosum** A. Nelson, Bull. Torr. Bot. Club, **26**: 125.

Resembles *L. apetalum*, but is lower and more bushy and with evident petals. Dry hills.

MONTANA: Lima, 1895, *Rydberg, 2658;* Gallatin City, 1883, *Scribner, 8B* (?).

Lepidium apetalum Willd. Sp. Pl. **3**: 439 [Syn. Fl. **1**^{1}: 127; Ill. Fl. **2**: 112]; *Lepidium intermedium* Gray, Man. Ed. 2, 38 [Man. R. M. 26].

In loose soil, up to an altitude of 2000 m.

MONTANA: Spanish Basin, June 24, 1897, *Rydberg & Bessey, 4140;* Pony, July 6, *4141;* Helena, *F. D. Kelsey;* Madison Co., *Mrs. McNulty:* Custer Co., 1892, *Mrs. Light.*

Thlaspi alpestre L. Sp. Pl. Ed. 2, 903 [Syn. Fl. **1**^{1}: 123; Man. R. M. 26; Bot. Cal. **1**: 45].

Among rocks in the subalpine region, at an altitude of 2500–3000 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 120;* Spanish Basin and Peaks, 1896, *Flodman, 508* and *509;* June 28, 1897, *Rydberg & Bessey, 4144;* Bridger Mts., June 14 and 15, *4142* and *4143;* Bozeman, 1892, *Mrs. Alderson;* Belts Mts., 1888, *R. S. Williams, 165;* Bridger Mts., 1892, *W. T. Shaw;* Bozeman Pass, 1883, *Scribner, 89;* Ross' Hole, 1880, *Watson.*

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 568.*

Schoenocrambe linifolia (Nutt.) Greene, Pittonia, **3**: 127; *Sisymbrium linifolium* Nutt.; Torr. & Gray, Fl. N. A. **1**: 91; [Syn. Fl. **1**^{1}: 138; Man. R. M. 23]; *Nasturtium linifolium* Nutt. Journ. Acad. Phila. **7**: 12; *Sisymbrium junceum* Brewer & Wats. Bot. Cal. **1**: 41: not Bieb.

In establishing the genus, Professor Greene acknowledged three species, which have generally been included in *Sisymbrium linifolium.* I have seen too little material to enter upon any discussion regarding their validity as species. They are all found in Montana. *S. linifolius* is a rather tall slender plant with linear leaves which have entire margins, except the lower ones, which are sometimes dentate but not pinnatifid.

MONTANA: Melrose, 1895, *Rydberg, 2671;* Lewis & Clarke Co., *Mrs. Muth;* Bannock City, 1880, *Watson.*

* **Schoenocrambe pygmaea** (Nutt.) Greene, Pittonia, **3**: 128; *Sisymbriam pygmaeum* Nutt.; Torr. & Gray, Fl. N. A. **1**: 91.

A low plant about 2 dm. high, more branched, slightly hairy, and with the lower leaves pinnatifid. It grows in dry soil, at an altitude of about 2000 m. (?)

MONTANA: Headwaters of Missouri, *Wyeth;* Sheridan, 1892, *H. M. Fitch;* Helena, 1892, *F. D. Kelsey.*

* **Schoenocrambe pinnata** Greene, Pittonia, 3: 127.

Taller than the first species, apparently not branched, glabrous and glaucous and with at least the lower leaves deeply pinnatifid. I have seen one specimen which may be refered here.

MONTANA: Beaverhead Co., 1888, *Tweedy, 113*.

* **Barbarea Americana.**

Barbarea vulgaris gracilis Wats. Bot. King's Exp. 5: 16; not DC.

Apparently biennial, 3–4 dm. high, glabrous, strict, often variegated with red. Basal leaves broadly elliptic, wavy, simple or with one or two pairs of small lobes on the petiole; lower stem-leaves similar, but with the petiole enlarged at the base and clasping; the upper stem-leaves oblong, sessile, sinuately lobed or toothed; flowers light yellow; petals narrowly spatulate, 2–4 mm. long; pod 2–2.5 cm. long and scarcely 2 mm. wide, slightly angled, ascending, or at first nearly erect, on pedicels 2–3 mm. long; style very short, scarcely 0.5 mm. long: seeds ovoid, grayish brown, finely pitted.

This has been mistaken for the introduced *B. Barbarea* (L.) MacM. (*B. vulgaris* R. Br.), but has much smaller flowers, shorter pedicels and styles, and is a native. Ascends in the mountains to an altitude of 3000 m.

MONTANA: 1845, *C. A. Geyer;* Spanish Basin, 1896, *Flodman, 510;* Bridger Mountains, June 10, 1897, *Rydberg & Bessey, 4145* (type); Spanish Basin, July 1, *4155:* Basin, 1892, *Kelsey*.

YELLOWSTONE PARK: Blacktail Deer Creek, 1885, *Tweedy, 574*.

NORTHWEST TERRITORY: *Richardson* (Franklin's Journey).

NEVADA: East Humboldt Mountains, 1868, *S. Watson, 66*.

Brassica arvensis (L.) B. S. P. Prel. Cat. N. Y. 5 [Ill. Fl. 2: 119]; *Sinapsis arvensis* L. Sp. Pl. 668: *Brassica Sinapistrum* Boiss. Voy. Espagne, 2: 39 [Syn. Fl. 1^1: 133; Man. R. M. 23].

Introduced in fields and around dwellings.

MONTANA: Helena, 1891, *F. D. Kelsey*.

* **Brassica Napus** L. Sp. Pl. 666.

Escaped from cultivation: distinguished by its glabrous leaves.

MONTANA: Emigrant Gulch, Aug. 22, 1897, *Rydberg & Bessey, 4238*.

Roripa Nasturtium (L.) Rusby, Mem. Torr. Bot. Club, 3^3: 5 [Ill. Fl. 1: 126]; *Sisymbrium Nasturtium* L. Sp. Pl. 657: *Nasturtium officinale* R. Br.; Ait. Hort. Kew. Ed. 2, 4: 109 [Syn. Fl. 1^1: 146; Man. R. M. 24; Bot. Cal. 1: 43].

In running water, up to an altitude of 2000 m.

Montana: East Gallatin Swamp, 1895, *Flodman, 488;* Fridley, 1887, *Tweedy, 20;* Helena, *F. D. Kelsey;* Upper Missouri, 1882, *Canby.*

Roripa sinuata (Nutt.) Hitchcock, Spring Fl. Manhattan, 18 [Ill. Fl. **2**: 124]; *Nasturtium sinuatum* Nutt.; Torr. & Gray, Fl. N. A. **1**: 73 [Syn. Fl. **1**^{1}: 147: Man. R. M. 24; Bot. Cal. **1**: 43].

On river-bottoms throughout the plain-region, reaching an altitude of a little over 1000 m.

Montana: Great Falls, 1885, *R. S. Williams, 63;* Custer Co., 1892, *Mrs. Light.*

* **Roripa calycina** (Engelm.); *Nasturtium calycinum* Engelm. Trans. Am. Phil. Soc. (II.) **12**: 184: *N. sinuatum calycinum* Wats.: Gray, Syn. Fl. **1**^{1}: 147.

Nearest related to *R. sinuata*, but is, according to Engelmann, an annual. It is papillose-puberulent, and has a short ovate pod.

Montana: Yellowstone, 1854, *Hayden.*

Roripa palustris (L.) Bess. Enum. 27 [Ill. Fl. **2**: 125]; *Sisymbrium amphibium palustre* L. Sp. Pl. 657; *Nasturtium palustre* DC. Syst. Veg. **2**: 191 [Man. R. M. 24; Bot. Cal. **1**: 43]; *N. terrestre* R. Br.; Ait. Hort. Kew. Ed. 2, **4**: 110 [Syn. Fl. **1**^{1}: 147].

Rather rare, in wet places, up to an altitude of 2500 m.

Montana: Bridger Mts., 1896, *Flodman, 489.*

Yellowstone Park: 1884, *Tweedy, 1898.*

Roripa hispida (Desv.) Britton, Mem. Torr. Bot. Club, **5**: 169 [Ill. Fl. **2**: 125]; *Brachylobus hispidus* Desv. Journ. Bot. **3**: 183; *Nasturtium palustre hispidum* Gray, Man. Ed. 2, 30 [Syn. Fl. **1**^{1}: 148; Man. R. M. 24; Bot. Cal. **1**: 42].

In swamps, up to an altitude of 2000 m.

Montana: Sheep Creek, 1895, *Flodman, 487;* Great Falls, 1884, *F. W. Anderson, 35.*

Roripa curvisiliqua (Hook.) Bessey, Mem. Torr. Bot. Club, **5**: 169 [Ill. Fl. **2**: 126]; *Sisymbrium curvisiliqua* Hook. Fl. Bor. Am. **1**: 61; *Nasturtium curvisiliqua* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 73, in part [Syn. Fl. **1**^{1}: 148; Man. R. M. 24; Bot. Cal. **1**: 42].

In wet places, at an altitude of 2000–2500 m.

Montana: Spanish Basin, June 30 and July 1, 1897, *Rydberg &*

Bessey, 4149 and *4150*: Neihart, 1886, *R. S. Williams, 368;* West Gallatin, 1883, *Scribner, 8d.*

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4151.*

* **Roripa Nuttallii** (Wats.); *Nasturtium curvisiliqua Nuttallii* Wats.; Gray, Syn. Fl. **1**¹: 148, except the synonym, *N. polymorphum* Nutt.

It is much taller and simpler than *R. curvisiliqua*, with larger flower and thicker less curved pods.

MONTANA: Old Hollowtop, Pony Mts., July 9, 1897, *Rydberg & Bessey, 4154.*

* **Roripa lyrata** (Nutt.): *Nasturtium lyratum* Nutt.; Torr. & Gray, Fl. N. A. **1**: 73; *Nasturtium curvisiliqua lyratum* Wats. Bot. Cal. **1**: 43.

This was included in *R. curvisiliqua* by Watson, but is as distinct as any of the species. It is very low and spreading, with lyrately deeply divided leaves having broad lobes, and a shorter thicker almost straight pod, which is generally narrowed upward and tipped with a very short style; it is evidently nearer related to *R. obtusa* than to *R. curvisiliqua*. It grows on sand bars and gravelly shores, at an altitude of 2000–2500 m.

MONTANA: Helena, 1882, *Tweedy.*

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 4152, 4153;* Swan Lake, 1885, *Tweedy, 561;* 1873, *C. C. Parry, 26.*

Roripa obtusa (Nutt.) Britton, Mem. Torr. Bot. Club, **5**: 169 [Ill. Fl. **2**: 124]; *Nasturtium obtusum* Nutt.; Torr. & Gray, Fl. N. A. **1**: 74 [Syn. Fl. **1**¹: 148: Man. R. M. 24: Bot. Cal. **2**: 431]. Rare; in wet soil.

MONTANA: Lima, 1895, *Rydberg, 2695;* Bozeman, 1891, *W. T. Shaw.*

Roripa alpina (Wats.): *Nasturtium obtusum* var. (?) *alpinum* Wats. Bot. King's Exp. **5**: 15 [Syn. Fl. **1**¹: 148; Man. R. M. 24].

The original specimens were alpine and dwarfed and do not give a good idea of the plant, which is often 2–3 dm. high. The short oblong ovate pod on a rather elongated pedicel and the upright and simple stem place it nearer to *R. palustris* and *R. hispida*, from both of which it is distinguished by the less deeply divided leaves. In wet places on mountains and hillsides, at an altitude of 2000–3000 m.

MONTANA: Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 4147;* Cedar Mountain, July 16, *4148.*

* **Dentaria macrocarpa** Nutt.; Torr. & Gray, Fl. N. A. **1**: 88 [Syn. Fl. **1**^{1}: 154].

A genus resembling *Cardamine*, but with the stem leafless below and bearing some leaves above. The basal leaves in this species are rather thick, ternate, and with oblong or obovate sinuately toothed leaflets; segments of the stem leaves linear.

MONTANA: McDonald's Peak, 1883, *Canby, 22.*

Cardamine Breweri Wats. Proc. Am. Acad. **10**: 339 [Syn. Fl. **1**^{1}: 157; Man. R. M. 18; Bot. Cal. **1**: 31.]

Common in open and damp woods, at an altitude of 1500–2500 m. Sometimes all the leaves are entire and without any lobes on the petioles.

MONTANA: Bridger Mts., 1896, *Flodman, 493;* Spanish Basin, *490;* Deer Lodge, 1895, *Rydberg, 2660;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 4157;* Spanish Basin, June 28–July 1, *4158, 4159* and *4160;* Belt Mts., 1886, *F. W. Anderson, 25;* Madison Valley, 1888, *F. Tweedy;* Gallatin Co., *Mrs Alderson;* Monarch, 1890, *R. S. Williams, 367;* Park Co., 1885, *Tweedy, 21.*

YELLOWSTONE PARK: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey, 4161;* Lake, Aug. 12, *4162;* Mammoth Hot Springs, 1885, *Tweedy, 572;* 1884, *Tweedy* (unifoliolate form); Lower Falls, 1871, *Hayden.*

* **Cardamine Leibergii** Holz. Cont. U. S. Nat. Herb. **3**: 212.

Resembles a small specimen of the preceding with simple stem leaves, but differs in the long proliferous rootstock, and the thick somewhat fleshy leaves, which are sinuately toothed with broadly triangular teeth. Grows among rocks, at an altitude of 2000–3000 m.

MONTANA: Lima, 1895, *Rydberg, 2663;* Bozeman Cañon, *2664.*

Cardamine Pennsylvanica Muhl.; Willd. Sp. Pl. **3**: 486 [Syn. Fl. **1**^{1}: 158]; *C. hirsuta* Brew. & Wats. Bot. Cal. **1**: 30 [Man. R. M. 19]; not L.

The description in Coulter's Manual includes both *C. Pennsylvanica* and *C. hirsuta* L. The former is a taller glabrous plant, generally over 3 dm. high, with spreading pedicels, while the latter is commonly less than 2 dm. tall, hispidulous above and with erect pods.

MONTANA: Melrose, 1895, *Rydberg, 2662;* Bozeman Cañon, *2661;* Jefferson City, 1883, *Scribner, 8f.*

* **Cardamine oligosperma** Nutt.; Torr. & Gray, Fl. N. A. **1**: 85 [Syn. Fl. **1**^{1}: 158; Bot. Cal. **1**: 30].

Like the last, but with erect, few- (8–20) seeded pods and a very short style. It is a plant really belonging to the region west of the mountains, but collected at one place near a spring, at an altitude of 2000 m.

MONTANA: Bridger Mts., June 14, 1897, *Rydberg & Bessey, 4156.*

* **Cardamine unijuga** Rydberg, Bull. Torr. Bot. Club, **24**: 246.

Resembles the last but has only one pair, or seldom two pairs, of oblong leaflets on the stem leaves, the basal ones being mostly simple, small, cordate, obtuse and rounded sinuately 3-lobed. It is fairly common in swampy ground in southern Montana and the Park, at an altitude of 2000–2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 494:* July 1, 1897, *Rydberg & Bessey, 4163* and *4164* (large-leaved form with 2 pairs of leaflets).

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4165:* Mirror Lake, 1885, *Tweedy, 571.*

Physaria didymocarpa (Hook.) Gray, Gen. Ill. **1**: 162 [Ill. Fl. **2**: 135; Bot. Cal. **1**: 47; Syn. Fl. **1**^{1}: 121; Man. R. M. 26]; *Vesicaria didymocarpa* Hook. Fl. Bor. Am. **1**: 49.

Among exposed rocks, often on the top of the mountains, at an altitude of 1500–3000 m.

MONTANA: Little Belt Pass, 1896, *Flodman, 496;* Cottonwood Creek, *495;* Bridger Mts., June 15, 1897, *Rydberg & Bessey, 4167:* Cedar Mountain, July 16, *4168:* near Indian Creek, July 22, *4166:* Bozeman, 1882, *F. Tweedy:* Madison Co., 1888, *119:* Belt Mountains, 1886, *F. W. Anderson, 41:* Bozeman, 1892, *W. T. Shaw;* Missoula Co., *Mrs. Kennedy:* Belt River, 1888, *R. S. Williams, 515:* Bozeman, 1883, *Scribner, 81;* Fort Ellis, 1871, *Hayden;* Birch Creek, 1883, *Canby, 24.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall:* Mammoth Hot Springs, 1884, *Tweedy, 206.*

* **Physaria Geyeri** (Hook.) Gray, Gen. Ill. **1**: 162 [Syn. Fl. **1**^{1}: 121]: *Vesicaria Geyeri* Hook. Lond. Journ. Bot. **6**: 70.

Similar in habit to the preceding, but with a much smaller pod, which is compressed laterally and has a broad shallow rounded sinus at the apex. Rare in Montana.

MONTANA: Madison Co., 1888, *F. Tweedy, 119.*

Lesquerella alpina (Nutt.) Wats. Proc. Am. Acad. **23**: 251 [Syn. Fl. **1**^{1}: 117]; *Vesicaria alpina* Nutt.; Torr. & Gray, Fl. N. A. **1**: 102 [Man. R. M. 25].

On dry sandy hills, at an altitude of 1500–2500 m.

MONTANA: Lima, 1895, *Rydberg*, *2666*; Melrose, *2667*; Cottonwood Creek, 1896, *Flodman*, *497*: Spanish Basin, June 23, 1897, *Rydberg & Bessey*, *4170*; Gallatin Co., 1888, *Tweedy*, *118*; Lewis & Clarke Co.; *Mrs. Muth*; *Mr. Murphy*; Livingston, 1883, *Scribner*, *8m*; Bannock City, 1880, *Watson*.

***Lesquerella spathulata** Rydberg, Cont. U. S. Nat. Herb. **3**: 486 [Ill. Fl. **2**: 136].

Differs from the preceding in the broader leaves, the recurved pedicels, the shorter style and the less compressed pod. In *L. alpina* the pods are erect on straight pedicels. It is a species belonging to the Great Plains, growing on very dry hills, scarcely exceeding 1500 m. in altitude.

MONTANA: Great Falls, 1886, *F. W. Anderson*, *37*; 1891, *R. S. Williams*, *6*; Deer Lodge, 1891, *F. D. Kelsey*.

Lesquerella argentea (Pursh) MacM. Met. Minn. 263 [Ill. Fl. **2**: 137]; *Myagrum argenteum* Pursh, Fl. Am. Sept. 434: *Lesquerella Ludoviciana* Wats. Proc. Am. Acad. **23**: 252 [Syn. Fl. **1**^{1}: 118].

A plant belonging to the Great Plains, growing on dry hills at an altitude of 1000–1500 m.

MONTANA: Great Falls, 1885, *R. S. Williams*, *5*.

Bursa Bursa-pastoris (L.) Britton, Mem. Torr. Bot. Club, **5**: 172 [Ill. Fl. **2**: 139]; *Thlaspi Bursa-pastoris* L. Sp. Pl. 647: *Capsella Bursa-pastoris* Medic. Pfl. Gatt. **1**: 85 [Syn. Fl. **1**^{1}: 130; Man. R. M. 25; Bot. Cal. **1**: 44].

Naturalized around dwellings.

MONTANA: Madison Co., *Mrs. McNulty*; Helena, 1887, *F. D. Kelsey*.

Camelina sativa (L.) Crantz, Stirp. Austr. **1**: 18 [Ill. Fl. **2**: 139; Syn. Fl. **1**^{1}: 131; Man. R. M. 25]; *Myagrum sativum* L. Sp. Pl. 641.

Occasionally introduced.

MONTANA: Bozeman, 1888, *F. Tweedy*; Cottonwood Creek, 1892, *W. T. Shaw*; Helena, 1889, *F. D. Kelsey*; Bozeman, 1883, *Canby*, *33*.

* **Camelina microcarpa** Andz.; DC. Syst. **2**: 517 [Ill. Fl. **3**: 515]; *Camelina sylvestris* Wallr. Sched. Crit. 347 [Syn. Fl. **1**^{1}: 468].

Like the preceding, but more or less hirsute and with somewhat smaller pods. Also an introduced species. At the station cited below it had thoroughly established itself.

MONTANA; Pony, July 6, 1897, *Rydberg & Bessey, 4172.*

* **Draba micrantha** Nutt.: Torr. & Gray, Fl. N. Am. **1**: 109; *Draba Caroliniana micrantha* Gray, Man. Ed. 5, 72 [Syn. Fl. **1**^{1}: 106; Ill. Fl. **2**: 141].

An annual, with entire obovate leaves, minute flowers, and oblong hispid pods. It grows on dry hills in the plain and prairie region.

MONTANA: Great Falls, 1885, *F. W. Anderson, 23*: Helena, 1883, *Canby, 25.*

Draba nemorosa L. Sp. Pl. 643 [Syn. Fl. **1**^{1}: 107; Man. R. M. 17; Ill. Fl. **2**: 143].

Common on hillsides, at an altitude of 1500–2500 m.

MONTANA: Helena, 1890 and 1892, *F. D. Kelsey;* Bridger Mts., June 11, 1897, *Rydberg & Bessey, 4192*: Pony, July 6, *4191*: Grafton, 1892, *R. S. Williams, 11;* Bozeman, 1892, *W. T. Shaw;* Bozeman, 1883, *Scribner, 8a.*

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4190;* Swan Lake, 1885, *Tweedy, 565*: 1888, *Dr. Chas. H. Hall.*

Draba stenoloba Ledeb. Fl. Ross. **1**: 154 [Syn. Fl. **1**^{1}: 107; Man. R. M. 17; Bot. Cal. **1**: 28].

Rare, growing in exposed situations, at an altitude of 2500–3000 m.

MONTANA: Grizzly Creek, 1887, *Tweedy, 34.*

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4190.*

Draba crassifolia Grah. Edin. New Phil. Journ. **1829**: 182 [Syn. Fl. **1**^{1}: 108; Man. R. M. 17; Bot. Cal. **1**: 28].

Among rocks on the mountain top, at an altitude of about 3000 m.

MONTANA: Old Hollowtop, Pony Mts., July 9, 1897, *Rydberg & Bessey, 4189;* Stillwater Cañon, 1887, *Tweedy, 32.*

YELLOWSTONE PARK: 1884, *Tweedy.*

Draba nivalis Liljb. Vet. Akad. Handl. **1793**: 208 [Ill. Fl. **2**: 142; Syn. Fl. **1**^{1}: 109]; *Draba stellata nivalis* Regel, Bull. Soc. Nat. Mosc. **34**^{2}: 192 [Man. R. M. 16].

On alpine peaks among rocks, at an altitude of about 3000 m.

MONTANA: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4187;* Boulder Creek, 1887, *Tweedy, 36;* Lone Mountain, 1886, *Tweedy, 1085.*

* **Draba lonchocarpa**; *Draba nivalis elongata* Wats. Proc. Am. Acad. **23**: 258. 1886 [Syn. Fl. **1**^{1}: 100]; not *D. elongata* Host, 1827.

Like the last, but with narrowly linear pods 8–15 mm. long.

MONTANA: McDonald's Peak and Upper Marias Pass, 1883, *Canby, 26* and *27:* Cedar Mt., July 16, 1897, *Rydberg & Bessey, 4188;* Boulder Creek, 1887, *Tweedy, 26.*

Draba glacialis Adams, Mem. Soc. Nat. Mosc. **5**: 106 [Syn. Fl. **1**^{1}: 112]; *Draba alpina glacialis* Dickie, Journ. Linn. Soc. **11**: 33 [Man. R. M. 17; Bot. Cal. **1**: 29].

In this species Watson included at least four different plants, this and the three following. *D. glacialis* has an oblong acute pod which is considerably pubescent, and elongated oblong rather thin leaves, which much resemble those of *D. alpina*, but are longer, narrower, and with a distinct keel.

It is an alpine plant, growing at an altitude of about 3000 m.

MONTANA: Upper Marias Pass, 1883, *Canby, 28* and *29;* Madison Co., 1888, *F. Tweedy, 114;* Park Co., 1887, *35;* Lake Plateau, 1897, *P. Koch, 41* and *60;* Cedar Mt., July 16, 1897, *Rydberg & Bessey, 4186;* Old Hollowtop, *4174a* and *4185.*

YELLOWSTONE PARK: Mt. Washburn, 1885, *Tweedy, 566.*

* **Draba densifolia** Nutt.; Torr. & Gray, Fl. N. Am. **1**: 104; *Draba glacialis pectinata* Wats. Proc. Am. Acad. **23**: 260 [Syn. Fl. **1**^{1}: 112].

Differs from the preceding in the thicker shorter crowded leaves and flatter pod, which has somewhat longer pubescence. It grows in localities similar to those of the preceding, but is more common.

MONTANA: Little Belt Mts., 1896, *Flodman, 499;* Silver Bow, 1895, *Rydberg, 2669;* Bridger Mts., June 15, 1897, *Rydberg & Bessey, 4173;* Old Hollowtop, Pony, July 9, *4174;* Upper Marias Pass, 1883, *Canby, 28;* Madison Co., 1888, *Tweedy, 115.*

YELLOWSTONE PARK: 1884, *Tweedy, 204.*

* **Draba oligosperma** Hook. Fl. Bor. Am. **1**: 51.

Differs from the two preceding in the short nearly orbicular pod, which is finely puberulent or glabrate, and usually in the much smaller leaves and lighter flowers. It is often associated with *D. densifolia* and its distinctness is readily seen. It is the most common of the four species usually included in *D. glacialis*.

MONTANA: Little Belt Pass, 1896, *Flodman, 498;* Madison Co., 1888, *F. Tweedy, 114*, in part: Helena, 1889, *F. D. Kelsey;* Bridger Mts., June 12 and 14, *Rydberg & Bessey, 4180, 4182, 4183* and *4184;* Deer Lodge, 1892, *W. T. Shaw (?);* Silver Bow Co., *Mrs. Moore (?)*.

YELLOWSTONE PARK: 1884, *Tweedy, 205*.

* **Draba andina** (Nutt.) A. Nelson, Bull. Torr. Bot. Club, **26**: 352; *Draba oligosperma andina* Nutt.: Torr. & Gray, Fl. N. Am. **1**: 104.

Like the preceding, but more densely pulvinate-cespitose, the flowering stems and leaves shorter and the larger flowers yellow. In habit it more resembles *D. densifolia*, but the leaves are less rigid and not so strongly ribbed, and the pod is that of *D. oligosperma*. On exposed alpine peaks, at an altitude of about 3000 m.

MONTANA: Bridger Mountains, June 15, 1897, *Rydberg & Bessey, 4175, 4179* and *4181;* Mt. Chauvet, July 29, *4176* and *4177;* Old Hollowtop, Pony, July 9, *4178;* Lima, 1895, *Rydberg, 2668;* Madison Co., 1888, *Tweedy, 114*, in part, and *115*.

YELLOWSTONE PARK: 1873, *Parry, 16*.

(?) **Draba incana** L. Sp. Pl. **2**: 643 [Syn. Fl. **1**^{1}: 111; Man. R. M. 17; Ill. Fl. **2**: 142].

In the only specimens seen from Montana the pod is elongated, tapering upward, tipped with a short style and hairy. In all other respects it resembles the typical form.

MONTANA: Upper Sand Coulee, *R. S. Williams, 806*.

Draba aurea Vahl: Hornem. Tors. Oec. Plantel, Ed. 2, 599 [Syn. Fl. **1**^{1}: 110: Man. R. M. 18; Ill. Fl. **2**: 143].

Dry hills in the mountain regions, at an altitude of 2000–2500 m.

MONTANA: Melrose, 1895, *Rydberg, 2670;* Spanish Basin, July 28, 1897, *Rydberg & Bessey, 4193;* Belt Mountains, 1885, *F. W. Anderson;* Upper Marias Pass, 1883, *Canby, 31*.

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 569*.

* Draba crassa.

Draba chrysantha Wats. Proc. Am. Acad. **17**: 364, in part.

Perennial, with a short erect rootstock and several ascending or decumbent stems, 5–15 cm. high, sparingly pubescent with short villous simple hairs; basal leaf broadly oblanceolate or spatulate, 2–4 cm. long, rather thick, generally entire, seldom slightly sinuate-toothed, sparingly ciliate: stem-leaves similar but shorter; pedicels at first short, in fruit about 1 cm. long, more or less spreading; sepals oblong, fully 2 mm. long, obtuse; petals yellow, 3–5 mm. long; pod ovate-oblong, 8–10 mm. long and about 4 mm. wide, tipped with a style 1.5 mm. long, often somewhat crisped, slightly twisted or curved sideways.

Draba chrysantha Wats. was based on three specimens, two collected in Colorado by Greene and Brandegee and one from Arizona collected by Lemmon. It is evident that it includes more than one species. As Greene's specimens are the ones first cited, they may be taken as the type of the species. These are about 5 cm. high, with erect stems, smaller flowers, and pods which are scarcely 2 mm. wide; the leaves are almost linear and rather thin. Lemmon's specimens are very similar, but much larger, about 1 dm. high, with narrowly linear-lanceolate leaves 5–6 cm. long; the flowers and the pods are like those of Greene's specimens. Brandegee's specimens, on the contrary, have the broad short rather fleshy leaves and broad pods described above. *Draba crassa* grows among rocks on the tops of the higher mountains, at an altitude of 3000–5000 m. The following specimens have been seen:

COLORADO: Gray's Peak, 1895, *Rydberg* (type); Sawatsh Range, 1880, *T. S. Brandegee.*

MONTANA: Haystack Peak, Park Co., 1887, *Tweedy, 33.*

Smelowskia calycina (Desv.) C. A. Meyer: Ledeb. Fl. Alt. **3**: 170 [Syn. Fl. **1**^{1}: 136; Man. R. M. 24; Bot. Cal. **1**: 42]; *Hutchinsia calycina* Desv. Journ. Bot. **3**: 168.

Among rocks on the highest peaks, at an altitude of 3000 m. or more.

MONTANA: Old Hollowtop, Pony Mts., July 7 and 9, 1897, *Rydberg & Bessey, 4194:* Indian Creek, July 22, *4196;* Mt. Chauvet, July 29, *4195;* Boulder Creek, Park Co., 1887, *Tweedy, 26;* Lake Plateau, 1897, *P. Koch, 60;* Belt Mountains, 1883, *Scribner, 81;* Upper Marias Pass, 1883, *Canby, 29;* McDonald's Peak, *32;* Odell's, 1880, *Watson.*

YELLOWSTONE PARK: 1884, *Tweedy;* Mt. Washburn, 1885, *560;* Stinking Water, 1873, *C. C. Parry, 17.*

* Sophia intermedia.

Annual; stems 3–7 dm. high, sparingly grayish puberulent, especially below, or sometimes glabrate, often glandular above, the hairs more or less stellate; leaves twice or thrice pinnatifid, the primary divisions oblanceolate or obovate, divided to near the midrib into linear or linear-oblong segments, sparingly puberulent or glabrate; raceme rather long; pedicels in fruit 1–1.5 cm. long, divergent, sometimes nearly at right angles; pods club-shaped, slightly curved, glabrous, 5–10 mm. long and 1 mm. wide, with seeds more or less distinctly in two rows, erect or ascending.

It has been nearly impossible to distinguish between *S. canescens* and *S. incisa*, as, especially in the Missouri valley, most of the specimens do not agree with either, being almost glabrous or slightly puberulent with stellate hairs, but not canescent. They have therefore been referred to *S. incisa*. But the pod is more or less club-shaped and evidently 2-serial, and if this character has been taken into consideration, they have been refered to *S. canescens*. I think that the trouble will be removed if a third species, intermediate between the other two, is admitted. This species is the most common in the region west of the Missouri, from Indian Territory to the Saskatchewan, and extending westward to the Rockies. All the specimens from this region referred either to *S. incisa* or to *S. canescens* may belong to *S. intermedia;* at least I have not seen any that may be referred to either of the two. West of the mountains *S. intermedia* is rare.

From *S. incisa* it differs in the shorter club-shaped pods, which are 2-serial and erect or ascending on spreading pedicels, and in the form of the segments of the leaves. In *S. incisa* the primary divisions are ovate-lanceolate and divided only about half way to the midrib into ovate teeth. The pubescence, if any, is also different, not stellate, but consisting, of longer pilose hairs. From *S. canescens* it differs in the narrow segments of the leaves and the sparser, not cinereous, pubescence. It perhaps most resembles *S. filipes*, but that species has pods similar to those of *S. incisa*, is perfectly glabrous, and has less dissected leaves.

S. intermedia is not uncommon on hillsides, up to an altitude of 2500 m.

MONTANA: Melrose, 1895, *Rydberg, 2672;* Bridger Mts., June 11–14, 1897, *Rydberg & Bessey, 4199* and *4200;* Cedar Mt., July 16, *4198* (broad leaved); West Gallatin, 1883, *Scribner, 8p;* Beaver

Head Co., 1888, *Tweedy, 116;* Bozeman, 1892, *W. T. Shaw;* Helena, 1890, *F. D. Kelsey;* Custer Co., 1892, *Mrs. Light.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* East Fork of Yellowstone, 1885, *F. Tweedy, 575.*

* **Sophia filipes** (Gray) Heller, Bull. Torr. Bot. Club, **24**: 310; *Sisymbrium incisum filipes* Gray, Pl. Fendl. 8 [Syn. Fl. **1**^{1}: 140; Bot. Cal. **1**: 41]: *Sisymbrium longipedicellatum* Fourn. Thèse Crucif. 59.

A near relative of the preceding species and *S. incisa.* The pods are most like those of *S. intermedia*, but are borne on slightly longer and divergent pedicels. It is an almost glabrous plant, distinguished by the less dissected leaves, the upper segment becoming elongated-linear and almost entire. On dry hillsides, at an altitude of about 2000 m.

MONTANA: Pony, July 6, 1897, *Rydberg & Bessey, 4197;* Bozeman, 1882, *Tweedy;* Bannock City, 1880, *Watson.*

* **Sophia Hartwegiana** (Fourn.) Greene, Pittonia, **3**: 95: *Sisymbrium Hartwegianum* Fourn. Thèse Crucif. 66; *Sisymbrium incisum Hartwegianum* Brew. & Wats. Bot. Cal. **1**: 41 [Syn. Fl. **1**^{1}: 139].

Distinguished by its comparatively large twice or thrice pinnately dissected leaves with short lobes, and linear nearly erect pods on short pedicels. In rich soil, at an altitude of 2000–2500 m.

MONTANA: Cliff Lake, Madison Co., July 27, 1897, *Rydberg & Bessey, 4201;* Electric Peak, Aug., *4202;* Bozeman, 1892, *W. T. Shaw;* Gallatin Co., *Mrs. Alderson.*

Arabis Nuttallii Robinson; Gray, Syn. Fl. **1**^{1}: 160: *Arabis spathulata* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 81 [Man. R. M. 19; Bot. Cal. **1**: 32].

In valleys and on hillsides, at an altitude of 2000–2500 m.

MONTANA: Bridger Mountains, June 11, 1897, *Rydberg & Bessey, 4229;* Silver Bow Co., *Mrs. Moore;* Belt Mountains, 1892, *R. S. Williams, 167;* Gallatin Co., *Mrs. Alderson;* Upper Marias Pass, 1883, *Canby, 17;* Bozeman Pass, *Scribner, 8k.*

YELLOWSTONE PARK: Swan Lake and Sepulchre Mountains, 1885, *Tweedy, 559.*

Arabis glabra (L.) Bernh. Syst. Verz. Erf. 195 [Ill. Fl. **2**: 150]; *Turritis glabra* L. Sp. Pl. 666; *Arabis perfoliata* Lam. Encycl. **1**: 219 [Syn. Fl. **1**^{1}: 160; Man. R. M. 9; Bot. Cal. **1**: 31].

Rather common in rich soil, up to an altitude of 2500 m.

MONTANA: Spanish Basin, July 1, 1897, *Rydberg & Bessey*, *4205*; Bridger Mts., June 11–17, *4207–4209*: Spanish Basin, June 30, *4204*; Bozeman, 1882, *Tweedy*, *153*, in part; 1887, *30* (a form with broad leaves and angled pod, similar to *Rydberg & Bessey*, *4203*); Belt Mts., 1885, *F. W. Anderson*; Electric Peak, Aug. 20, 1897, *Rydberg & Bessey*, *4203* (?): West Gallatin, 1883, *Scribner*, *8h*; Jefferson City, *8c*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *F. Tweedy*, *558*; 1884, *200* (similar to *30*).

* **Arabis furcata** Wats. Proc. Am. Acad. **17**: 362 [Syn. Fl. **1**¹: 161].

A low perennial, somewhat resembling *A. Nuttallii*, but glabrous, with larger flowers, and rather thick and shining basal leaves. Rather common in exposed situations on the mountains, at an altitude of 2500–3500 m.

MONTANA: Bozeman, 1895, *Rydberg*, *2675*; Bridger Mts., 1896, *Flodman*, *503*; Bridger Mts., June 15, 1897, *Rydberg & Bessey*, *4230*; Lone Mt., 1886, *Tweedy*, *1084*; Middle Creek, 1887, *27*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *4228½*.

Arabis hirsuta Scop. Fl. Carn. Ed. 2, **2**: 30 [Syn. Fl. **1**¹: 162: Man. R. M. 9; Ill. Fl. **2**: 149; Bot. Cal. **1**: 32].

In valleys, on river banks, etc., up to an altitude of 2500 m.

MONTANA: Jack Creek, July 16, 1897, *Rydberg & Bessey*, *4211*: Helena, 1887, *Kelsey*.

YELLOWSTONE PARK: Gardiner, 1885, *Tweedy*, *555*: Mammoth Hot Springs, *556*.

Arabis Holboellii Hornem. Fl. Dan. **11**: *pl. 1879* [Syn. Fl. **1**¹: 164; Man. R. M. 164; Ill. Fl. **2**: 150; Bot. Cal. **1**: 33].

Dry hills, at an altitude of 1000–2000 m.

MONTANA: Pony, July 6–8, 1897, *Rydberg & Bessey*, *4227* and *4228*; Bridger Mts., June 18, *4224*; Bozeman, 1882, *Tweedy*; Great Falls, 1888, *R. S. Williams*; West Gallatin, 1883, *Scribner*, *8c*.

***Arabis Bourgovii**: *Turritis patula* Grah. Edinb. New Phil. Journ. **1829**: 350. 1829; *Arabis Holboellii* (?) *patula* Wats.; Gray, Syn. Fl. **1**¹: 164. 1895; not *A. patula* Weinm. 1810.

More slender than the preceding and almost glabrous, with pods broader and less reflexed. Hillsides, at an altitude of 2000 m.

MONTANA: Jack Creek, July 14, 1897, *Rydberg & Bessey*, *4222*.

***Arabis Columbiana** Macoun, Cat. Can. Pl. **2**: 304.

Resembles a small form of the preceding, but the pods are divergent, not reflexed, and somewhat curved. A mountain plant, growing at an altitude of 2000–3000 m.

MONTANA: Spanish Peaks, 1895, *Flodman*, *500;* Old Hollowtop, Pony Mts., July 7–9, 1897, *Rydberg & Bessey*, *4215* and *4216;* Cedar Mt., July 16, *4217;* Spanish Basin, June 28, *4214;* Bridger Mts., June 15, *4213*.

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy*, *554*.

Arabis canescens Nutt.; Torr. & Gray, Fl. N. Am. **1**: 83 [Syn. Fl. 1^1: 165; Man. R. M. 20; Bot. Cal. **2**: 431].

Coulter describes this species as having linear-oblanceolate to broadly spatulate leaves and more or less spreading or reflexed pods on short pedicels. The type specimens, collected in the Rocky Mountains (the locality is not given and it may have been in Wyoming, Montana or Idaho), some collected by Prof. Aven Nelson in Wyoming and the following from Montana, have almost linear leaves and strongly reflexed narrow pods. The stems are several, from a perennial base, slender and very strict. All other specimens so determined seen by me belong to the following, or to *A. Lemmonii*. Grows on dry hills, at an altitude of 2000–3000 m.

MONTANA: Melrose, 1895, *Rydberg*, *2673;* Lima, *2674;* Elk Mts., 1896, *Flodman*, *502;* Bridger Mts., June 14, 1897, *Rydberg & Bessey*, *4225*.

YELLOWSTONE PARK: Stinking Water, 1873, *Parry*, *30*.

***Arabis puberula** Nutt.; Torr. & Gray, Fl. N. Am. **1**: 82.

Like the last, but taller and simpler and with oblanceolate leaves, the cauline ones auricled. It is rare in Montana. The specimens collected by Howell and Suksdorf, and cited under *A. canescens* in the Synoptical Flora, belong here.

MONTANA: Bozeman, 1892, *W. T. Shaw*.

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy*, *554*.

Arabis Lemmonii Wats. Proc. Am. Acad. **22**: 467 [Syn. Fl. 1^1: 166]; *Arabis canescens latifolia* Wats. King's Exp. **5**: 17.

Resembles the two preceding in the flowers and pubescence; but the stems are ascending with few cauline leaves, the basal leaves broadly spatulate and the pods spreading and much broader. On the higher mountains, at an altitude of about 3000 m.

MONTANA: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey*, *4220;* Indian Creek, July 22, *4221;* Cedar Mountain, July 16, *4218;* Bridger Mountains, June 15, *4223* and *4226:* Milk Creek, 1887, *Tweedy, 31;* Helena, 1887, *F. W. Anderson;* Bozeman, 1892, *Mrs. Alderson;* Upper Marias Pass, 1883, *Canby*, *16*, in part.

YELLOWSTONE PARK: 1884, *Tweedy, 201.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4219.*

*__Arabis microphylla__ Nutt.; Torr. & Gray, Fl. N. Am. **1**: 82 [Syn. Fl. **1**^{1}: 167].

Perennial, with several slender stems about 2 dm. high, from a branching caudex; leaves narrowly oblanceolate, stellate-pubescent and with more or less ciliate petioles; flowers small, rose-tinged: pods narrow, erect or slightly spreading. On rocks, at an altitude of 2000–3000 m.

Arabis Drummondii Gray, Proc. Am. Acad. **6**: 187 [Syn. Fl. **1**^{1}: 166; Man. R. M. 20]; *Turritis stricta* Grah. Ed. New Phil. Journ. **1829**: 350.

Rather common in the valleys, at an altitude of 2000–2500 m.

MONTANA: Bridger Mountains, June 14. 1897, *Rydberg & Bessey*, *4209;* Park Co., 1887, *Tweedy, 29:* Bozeman, 1892, *W. T. Shaw;* Lewis & Clarke Co., *Mrs. Murphy;* Gallatin Co., *Mrs. Alderson;* Granite, 1892, *F. D. Kelsey:* Bozeman, 1883, *Scribner, 89.*

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4210;* 1884, *Tweedy, 199;* Mammoth Hot Springs, 1885, *Tweedy, 557;* Stinking Water, 1873, *Parry, 28.*

Arabis Lyallii Wats. Proc. Am. Acad. **9**: 122 [Syn. Fl. **1**^{1}: 166; Man. R. M. 20; Bot. Cal. **1**: 32].

Among rocks on the higher peaks, at an altitude of 2500–3500 m.

MONTANA: Spanish Basin, 1895, *Flodman, 501:* Lake Plateau, 1897, *P. Koch, 53:* Head of Stillwater, *69:* McDonald's Peak, 1883, *Canby, 18* and *19:* Upper Marias Pass, *16*, in part.

YELLOWSTONE PARK: 1884, *Tweedy, 202.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4212.*

Erysimum cheiranthoides L. Sp. Pl. 661 [Ill. Fl. **2**: 151; Syn. Fl. **1**^{1}: 143; Man. R. M. 22]: *Cheiranthus cheiranthoides* Heller, Cat. N. Am. Pl. 4; *Cheiranthus turritoides* Lam. Enc. **2**: 716.

In the valleys and cañons, up to an altitude of 2500 m.

MONTANA: Little Belt Mts., *Flodman, 504;* Cliff Lake, July 27, 1897, *Rydberg & Bessey, 4231;* Rochester Creek, 1888, *F. Tweedy, 112;* Helena, 1887, 1890 and 1891, *Kelsey;* 1882, *Canby.*

Erysimum inconspicuum (Wats.) MacM. Met. Minn. 268 [Ill. Fl. **2**: 151]; *Erysimum parviflorum* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 95. 1838 [Syn. Fl. 1^1: 143: Man. R. M. 22]; not Pers. 1807; *Erysimum asperum inconspicuum* Wats.; King's Exp. **5**: 24; *Cheiranthus inconspicuus* Greene, Pittonia, **3**: 134.

River banks and sandy places, at an altitude of 1000–2500 m.

MONTANA: Little Belt Mts., 1896, *Flodman, 505;* Clarke's Cañon, 1888, *F. Tweedy, 52;* Great Falls, 1888, *R. S. Williams, 738;* Lewis and Clarke Co., *Mrs. Muth;* Custer Co., 1892, *Mrs. Light.*

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy, 570.*

Erysimum pumilum Nutt.: Torr. & Gray, Fl. N. Am. **1**: 95 [Man. R. M. 22]; *Cheiranthus pumilus* Hornem. Hort. Hoffm. **2**: 613; *Cheiranthus asperrimus* Greene, Pittonia, **3**: 133.

In Coulter's Manual it is described as only 2–4 inches high. It is generally much taller, often as tall as *C. asper*, from which it differs in the somewhat smaller and lighter yellow flowers and the almost erect pods, which are very slender and often curved and twisted.

MONTANA: Madison Co., 1888, *Tweedy, 117;* Shields River, 1883, *Scribner, 80.*

Erysimum asperum DC. Syst. **2**: 505 [Syn. Fl. 143; Man. R. M. 22; Ill. Fl. **2**: 152]; *Cheiranthus asper* Nutt. Gen. **2**: 69 [Bot. Cal. **1**: 35].

On dry hills, up to an altitude of 2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 507;* Madison Co., 1888, *F. Tweedy, 117;* Bridger Mts., June 11 and 17, 1897, *Rydberg & Bessey, 4232, 4236* and *4237;* Pony, July 6, *4234;* Emigrant Gulch, *4235;* East Boulder, 1887, *Tweedy, 23;* Grafton, 1892, *R. S. Williams, 31;* Madison Co., *Mrs. Flora McNulty;* Bozeman, 1892, *W. T. Shaw.*

IDAHO: Mt. Chauvet, July 27, 1897, *Rydberg & Bessey, 4233.*

(?) **Erysimum occidentale** Robinson; Gray, Syn. Fl. 1^1: 144; *Cheiranthus occidentalis* Wats. Proc. Am. Acad. **23**: 261.

Rare; only one specimen seen, which is doubtfully referred to this species.

MONTANA: Bridger Mts., 1896, *Flodman, 506.*

CAPPARIDACEAE.

Cleome serrulata Pursh, Fl. Am. Sept. **2**: 441 [Ill. Fl. **2**: 155]; *Cleome integrifolia* Torr. & Gray, Fl. N. Am. **1**: 122 [Syn. Fl. 1^1: 183; Man. R. M. 28].

Along streams, in sandy or saline soil, up to an altitude of 2000 m.

MONTANA: Emigrant Gulch, Aug. 22, 1897. *Rydberg & Bessey, 4244;* Madison Co., 1886, *Tweedy, 1082:* Deer Lodge Co., *Miss Frances Hobson:* Helena, 1890 and 1891, *Kelsey;* Custer Co., 1892, *Mrs. Light;* Gallatin City, 1883, *Scribner, 9a.*

Polanisia trachysperma Torr. & Gray, Fl. N. Am. **1**: 669 [Syn. Fl. 1^1: 182; Man. R. M. 27; Ill. Fl. **2**: 158: Bot. Cal. **1**: 51]; *Jacksonia trachysperma* Greene, Pittonia, **2**: 175.

In sandy soil, perhaps up to an altitude of 2000 m.

MONTANA: Yellowstone River, Aug. 22, 1897, *Rydberg & Bessey, 4243;* Fridley, 1887, *F. Tweedy, 38;* Livingston, 1886, *1083;* Silver Bow Co., *Mrs. Moore;* Helena, 1891, *Kelsey:* Plains near the head of Missouri, 1882, *Canby:* Belt Creek, 1883, *Scribner, 9.*

DROSERACEAE.

* **Drosera rotundifolia** L. Sp. Pl. 281 [Torr. & Gray, Fl. N. Am. **1**: 146: Ill. Fl. **2**: 161: Bot. Cal. **1**: 213].

A small bog-plant with orbicular or broadly spatulate glandular-hairy leaves with reddish base, and small white flowers in a small raceme borne on a naked stem.

MONTANA: Lake Terry, 1892, *R. S. Williams, 898.*

CRASSULACEAE.

Sedum roseum (L.) Scop. Fl. Carn., Ed. 2, **1**: 326 [Ill. Fl. **2**: 165]: *Rhodiola rosea* L. Sp. Pl. 1035; *Sedum Rhodiola* DC. Plantes Gras. *pl. 143* [Man. R. M. 98; Torr. & Gray, Fl. N. Am. **1**: 558; Bot. Cal. **1**: 209].

Among rocks on the higher mountains, at an altitude of 3000 m. or more.

MONTANA: Little Belt Mts., 1896, *Flodman, 513:* Old Hollowtop, Pony Mountains, July 7–9, 1897, *Rydberg & Bessey, 4247* and *4248:* Mt. Blackmore, 1886, *Tweedy, 1095;* Beaver Head Co., 1888, *130:* Belt Mts., 1883, *Scribner, 55.*

Sedum rhodanthum Gray, Am. Journ. Sc. (II.) **33**: 405 [Man. R. M. 98].

In meadows, at an altitude of 2000–3000 m.

MONTANA: East Boulder, 1887, *Tweedy, 166;* Head of Stillwater, 1897, *P. Koch, 75.*

YELLOWSTONE PARK: Gibbon River, 1884, *Tweedy, 16;* Upper Falls, 1872, *Coulter;* Aug. 14, 1897, *Rydberg & Bessey;* Mud Springs, 1871, *Hayden.*

Sedum stenopetalum Pursh, Fl. Am. Sept. **1**: 324 [Torr. & Gray, Fl. N. Am. **1**: 560; Man. R. M. 99].

Dry hills, among stones and gravel, at an altitude of 2000–2500 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 131;* Head of the Missouri, *Wyeth;* Spanish Basin, 1896, *Flodman, 512;* Little Belt Mts., *511;* Spanish Basin, June 23 and 24, 1897, *Rydberg & Bessey, 4246;* Deep Creek, 1891, *R. S. Williams, 51;* Silver Bow Co., *Mrs. Moore;* Little Blackfoot River, 1883, *Canby, 129;* Boulder Creek, 1883, *Scribner, 55a;* Big Hole, 1880, *Watson.*

YELLOWSTONE PARK: 1885, *Tweedy, 431;* Stinking Water Creek, 1871, *Hayden.*

Sedum Douglasii Hook. Fl. Bor. Am. **1**: 228 [Torr. & Gray, Fl. N. Am. **1**: 559; Bot. Cal. **1**: 210; Man. R. M. 99].

Among rocks, at an altitude of about 2500 m.

MONTANA: Jocko River, 1883, *Canby, 128;* Ross' Hole, 1880, *Watson.*

YELLOWSTONE PARK: Continental Divide, 1871, *Hayden.*

Tillaea angustifolia Nutt.; Torr. & Gray, Fl. N. Am. **1**: 558 [Man. R. M. 98; Bot. Cal. **1**: 209].

Muddy banks, at an altitude of about 2500 m.

YELLOWSTONE PARK: Lake, 1885, *Tweedy, 440.*

SAXIFRAGACEAE.

Saxifraga oppositifolia L. Sp. Pl. 402 [Man. R. M. 90; Ill. Fl. **2**: 171].

Among rocks on the top of the highest mountains, at an altitude of about 3000 m.

MONTANA: East Boulder, Park Co., 1887, *F. Tweedy, 204;* Big Hole River, 1888, *Tweedy, 57;* Mt. Blackmore, 1886, *1156;* Old Hollowtop, Pony, July 9, 1897, *Rydberg & Bessey, 4273;* Mt. Chauvet, July 27, 1897, *4272.*

YELLOWSTONE PARK: Mt. Holmes, 1884, *F. Tweedy, 244.*

Saxifraga flagellaris Willd.; Sternb. Rev. Saxif. 25 [Man. R. M 91: Torr. & Gray. Fl. N. Am. 1: 564].

Among rocks, at an altitude of 3000 m.

MONTANA: Old Hollowtop, Pony, July 9, 1897, *Rydberg & Bessey, 4283.*

Saxifraga caespitosa L. Sp. Pl. 404 [Man. R. M. 91; Ill. Fl. 2: 173].

In damp places among rocks on top of the highest mountains, at an altitude of 2800–3500 m.

MONTANA: Yogo, 1885, *R. S. Williams, 755;* Indian Creek, July 22, 1897, *Rydberg & Bessey, 4275:* Old Hollowtop, Pony, July 9, *4274;* Upper Marias Pass, 1883, *Canby, 113;* Belt Mountains, 1883, *Scribner, 51b.*

YELLOWSTONE PARK: 1885, *Tweedy, 841.*

Saxifraga bronchialis L. Sp. Pl. 400 [Man. R. M. 91].

Among rocks on mountains and hills, at an altitude of 2000 m. and more.

MONTANA: 1892, *Mrs. L. A. Fitch;* Spanish Basin and Peaks, 1896, *Flodman, 518* and *519;* Mill Creek, 1887, *Tweedy, 257;* Gallatin Co., *Mrs. Alderson;* Lake Plateau, 1897, *P. Koch, 39;* Cedar Mt., July 16, 1897, *Rydberg & Bessey, 4279:* Spanish Basin, June 28, *4280;* Pony, July 7, *4281:* July 9, *4282;* Jocko River, 1883, *Canby, 112;* Jocko Lake, 1880, *Watson.*

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy, 842.*

IDAHO: Mt. Chauvet, July 27, 1897, *Rydberg & Bessey, 4278.*

Saxifraga cernua L. Sp. Pl. 403 [Man. R. M. 91; Ill. Fl. 2: 172].

In shaded places under rocks.

MONTANA: Yogo, 1888, *R. S. Williams, 751;* Rocky Mts., 1861, *Lyall.*

Saxifraga rivularis L. Sp. Pl. 404 [Man. R. M. 91].

Summits of the highest mountains, in wet places, at an altitude of about 3000 m.

YELLOWSTONE PARK: 1885, *Tweedy, 840.*

Saxifraga adscendens L. Sp. Pl. 405 [Man. R. M. 91].

High mountains, at an altitude of about 3000 m.

MONTANA: Mt. Blackmore, 1886, *Tweedy, 1157.*

Saxifraga debilis Engelm.; Gray, Proc. Am. Acad. **1863**: 62 [Man. R. M. 92].

On alpine peaks, in wet places among rocks, at an altitude of about 3000 m.

MONTANA: Old Hollowtop, Pony, July 9, 1897, *Rydberg & Bessey*, *4277;* July 7, *4276.*

YELLOWSTONE PARK: 1873, *C. C. Parry*, *101.*

Saxifraga punctata L. Sp. Pl. 401 [Man. R. M. 92; Bot. Cal. **1**: 195].

In springy places, at an altitude of 2000–3000 m.

MONTANA: Basin, 1892, *F. D. Kelsey;* Spanish Basin, 1896, *Flodman*, *515* and *517;* Sweet Grass Cañon, *516;* Gallatin Co., 1886, *Tweedy*, *1158;* Lewis & Clarke Co., *Mrs. Muth;* Belt Mts., 1886, *F. W. Anderson*, *136;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey*, *4284;* Emigrant Gulch, Aug. 23, *4285;* Jack Creek, July 15, *4286;* Spanish Basin, June 28, *4287;* Deep Creek, 1883, *Scribner*, *50.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1893, *F. H. Burglehaus;* 1885, *Tweedy*, *839.*

* **Saxifraga reflexa** Hook. Fl. Bor. Am. **1**: 249.

In foliage resembling *S. nivalis*, but with an open panicle, reflexed sepals and orange-spotted petals. In meadows, at an altitude of 2000–3000 m.

MONTANA: Belt Cañon, 1887, *R. S. Williams*, *700;* Spanish Basin, June 28, 1897, *Rydberg & Bessey*, *4271;* McDonald's Peak, 1883, *Canby*, *111;* Bozeman Pass, 1883, *Scribner*, *51a.*

* **Saxifraga Lyallii** Engler, Verh. Zool.-Bot. Ges. Wien, **19**: 542 [Index Crit. Saxifr. 30].

Characterized by its broad basal leaves, which are broadly obovate or almost orbicular with a more or less cuneate base and coarsely dentate above the middle, a few-flowered open inflorescence, white petals and club-shaped anthers.

MONTANA: McDonald's Peak and Upper Marias Pass, 1883, *Canby.*

* **Saxifraga Nutkana** Moç.; Ser. in DC. Prod. **4**: 40; Engler, Mon. 135 (in both as a synonym); *S. stellaris Brunoniana* Bong. Veg. Sitcha 140.

As to the validity of this species and its nomenclature see Dr. Small's discussion in Bull. Torr. Bot. Club, **23**: 368.

MONTANA: Lake Terry, 1892, *R. S. Williams*, *878.*

Saxifraga nivalis L. Sp. Pl. 401 [Man. R. M. 92: Ill. Fl. **2**: 174; Bot. Cal. **1**: 194].

On top of the higher mountains, at an altitude of 2500 m. or more.

MONTANA: Deer Lodge, *F. W. Traphagen, 1888:* Missoula, 1883, *Tweedy;* Upper Sand Coulee, 1888, *R. S. Williams, 9:* Old Hollowtop, Pony, July 9, 1897, *Rydberg & Bessey, 4267:* Cedar Mt., July 16, *4266.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1893. *F. H. Burglehaus;* Sepulchre Mt., 1885, *Tweedy, 857.*

* **Saxifraga aprica** Greene, Bull. Torr. Bot. Club. **23**: 25; *Saxifraga umbellulata* Greene, Erythea, **1**: 222.

Resembling somewhat *S. nivalis* in habit. Characterized by the numerous bulblets on the crown, spatulate-obovate petals and stout filaments. It grows on mountains, at an altitude of nearly 3000 m.

MONTANA: Mt. Chauvet, July 27, 1897, *Rydberg & Bessey, 4265.*

Saxifraga integrifolia Hook. Fl. Bor. Am. **1**: 249 [Bot. Cal. **1**: 194; Man. R. M. 92].

On mountain sides, at an altitude of 2000–3000 m.

MONTANA: Mullan Pass, 1889, *F. D. Kelsey*: Bozeman, 1892, *W. T. Shaw;* Bridger Mts., June 18, 1897, *Rydberg & Bessey, 4270:* June 11, *4269:* Grasshopper Valley, 1880, *Watson.*

* Saxifraga Rydbergii Small.

Perennial, from short rootstocks, acaulescent. Leaves basal; blades oblong to ovate, 1–3 cm. long, undulate or repand-dentate, glabrous or nearly so, bright green above, pale beneath, sessile, often with a broad petiole-like base: scapes solitary, erect, 5–10 cm. tall, purplish, glandular-pubescent above, simple to the inflorescence: cymules contracted, accompanied by short bracts, disposed in an interrupted cylindric raceme: calyx glabrous, tube broadly campanulate or nearly flat at maturity, the segments 5, triangular, 1–1.3 mm. long, rather obtuse: petals 5, elliptic-oblong, shorter than the sepals, fugacious, sessile: stamens 5; filaments subulate; follicles purple.

The only close relative of *Saxifraga Rydbergii* is *Saxifraga hieracifolia* W. & K. Selecting the more prominent characters that separate the two species in question we may state them as follows:

Saxifraga Rydbergii.—Leaf-blades sessile or with broad petiole-like bases; calyx glabrous, the segments triangular, less than 1.5 mm. long; petals oblong-elliptic, shorter than the calyx-segments.

Saxifraga hieracifolia.—Leaf-blades narrowed into long slender petioles; calyx pubescent, the segments ovate, 2 mm. long; petals linear-oblong, as long as the calyx-segments.

In rocky places on alpine peaks, at an altitude of about 3000 m.

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 4268.*

* **Saxifraga Montanensis** Small, Bull. Torr. Bot. Club, **23**: 367.

Nearest related to *S. Pennsylvanica*, from which it differs somewhat in habit, the turbinate calyx-tube and the triangular-ovate sepals which about equal the tube. It grows in mountain meadows, up to an altitude of 2500 m.

MONTANA: Mullan, 1890, and Helena, Priest's Pass, 1892, *F. D. Kelsey;* 1888, *F. Tweedy, 58:* Yogo, 1888, *R. S. Williams, 491;* Spanish Basin, July 1, 1897, *Rydberg & Bessey, 4264;* June 28, *4262;* June 30, *4263.*

YELLOWSTONE PARK: 1884, *Tweedy, 243;* 1885, *838;* Yellowstone Falls, Aug. 14, 1897, *Rydberg & Bessey, 4261:* 1871, *Hayden.*

* **Saxifraga ranunculifolia** Hook. Fl. Bor. Am. **1**: 246.

A peculiar species, very unlike any other in habit, with long-petioled 3-divided leaves with broadly cuneate cleft segments. It grows only in the western part of the State.

MONTANA: Jocko River, 1883, *Canby, 114.*

* **Therophon heucheriforme** Rydb. Bull. Torr. Bot. Club, **24**: 247; *Saxifraga Jamesii* Hook. Fl. Bor. Am. **1**: 47: not Torr.

It is distinguished from *T. Jamesii* (*Saxifraga Jamesii* Torr.) by the small bluish violet petals, which scarcely exceed the sepals, and the free styles. It grows among rocks on the higher mountains, at an altitude of 2500–3500 m.

MONTANA: East Boulder, 1887, *F. Tweedy, 255;* Bozeman, 1895, *Rydberg, 2677:* Bridger Mts., 1896, *Flodman, 514:* Gallatin Peak, 1886, *Tweedy, 1155:* Deer Lodge Co., *Miss Emma Ware;* Belt River Cañon, 1886, *F. W. Anderson, 135;* Sixteen Mile Creek, 1883, *Scribner, 51:* Tiger Butte, 1883, *Scribner:* Belt River Cañon, 1885, *R. S. Williams.*

YELLOWSTONE PARK: Three River Peak, 1885, *W. H. Weed;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 4260;* Hot Sulphur Springs, 1871, *Hayden.*

Therophon majus (Gray) Wheelock, Bull. Torr. Bot. Club, **23**: 70; *Boykinia major* Gray, Bot. Cal. **1**: 196 [Man. R. M. 93]; *B. occidentalis elata* Gray, Proc. Am. Acad. **8**: 383; not *B. elata* Nutt.

Wooded regions, at an altitude of less than 1000 m.

MONTANA: Jocko Cañon, 1880, *Watson.*

* Heuchera ciliata.

Stems two or three from a woody caudex, about 5 dm. high, terete, more or less brown, the lower portion, as well as the petioles, ciliate with white hairs, the upper portion finely and densely glandular-puberulent: leaves rounded-reniform, 3–4 cm. in diameter, slightly 5–7-lobed and rounded-crenate, glabrous above, sparingly hairy beneath; inflorescence a narrow panicle; cup cylindrical-campanulate, greenish, densely and finely glandular-puberulent, decidedly oblique and strongly gibbous at the base below, 6–8 mm. long; petals narrowly spatulate with a long claw, a little exceeding the oblong sepals, glandular-puberulent; stamens slightly exserted: seeds almost black, strongly hispid-muriculate.

Nearest related to *Heuchera hispida*, but the flowers are smaller, more glandular-puberulent, and more gibbous, and the leaves have more rounded teeth. It grows in crevices of rocks, at an altitude of 2000 m.

MONTANA: Mill Creek, 1887, *Tweedy, 259.*

* Heuchera grossulariifolia.

Cespitose, with a woody caudex; leaves all basal, numerous, the petioles 2–5 cm. long, very slender: blade rounded, heart-shaped, more or less deeply 5-cleft and crenate, 1–2 cm. in diameter, rather firm and shining, glabrous, except the ciliate margins, each rounded tooth tipped with a short bristle: stem naked, 2–4 dm. high, lower part glabrous, the upper portion finely glandular-puberulent; raceme simple; flowers on very short pedicels less than 2 mm. long: cup bell-shaped, 3–5 mm. long, yellowish, finely glandular-puberulent, slightly oblique; petals spatulate, slightly clawed, a little exceeding the sepals, white or pinkish; seeds oblong, brown, hispid-muricate under a lens.

It is somewhat intermediate between *H. Hallii* and *H. parvifolia*, but differs from both in the glabrate leaves and the bristle-tipped teeth; from the former also by the taller stem and the smaller flowers, and from the latter by the simpler raceme, the larger flowers, the campanulate cup, which is yellower, and the smaller leaves. *H. grossulariifolia* grows on rocky hillsides, at an altitude of about 2000 m.

MONTANA: Pony, July 6, 1897, *Rydberg & Bessey, 4288;* Blacktail Deer Creek, 1888, *Tweedy, 40.*

IDAHO: Ramshorn Mountain, *Dr. J. S. Newberry.*

Heuchera parvifolia Nutt.; Torr. & Gray, Fl. N. Am. **1**: 581 [Man. R. M. 94].

Common among rocks, at an altitude of 1000–3000 m.

MONTANA: Milk River, 1879, *Dr. Havard;* Anaconda, 1892, *F. D. Kelsey;* Lima, 1895, *Rydberg, 2678* and *2679;* Spanish Basin and Peaks, 1896, *Flodman, 520* and *522;* Cottonwood Creek, *521;* Cedar Mountains, July 16, 1897, *Rydberg & Bessey, 4289* and *4294;* Indian Creek, July 21, *4290;* Jack Creek, July 15, *4291;* Bridger Mountains, June 11–18, *4292* and *4297;* Electric Peak, Aug. 18, *4295;* Spanish Basin, June 23–24, *4293;* Beaver Head Co., 1888, *Tweedy, 56;* Bridger, 1892, *W. T. Shaw;* Great Falls, 1891, *R. S. Williams, 313;* Shields River, 1883, *Scribner, 52a.*

YELLOWSTONE PARK: 1884, *Tweedy, 246;* Soda Butte Creek, 1885, *Tweedy, 844.*

IDAHO: Mt. Chauvet, July 27, *Rydberg & Bessey, 4290.*

* **Heuchera glabella** Torr. & Gray, Fl. N. Am. **1**: 581; *Heuchera cylindrica glabella* Wheelock, Bull. Torr. Bot. Club, **17**: 203.

Resembles *H. cylindrica*, but has somewhat smaller, less hairy, rounded-reniform leaves and almost glabrous, not hirsute, stem. No specimen of *H. cylindrica* has been seen from Montana. It may occur there, as it is found in northern Idaho. *H. glabella* grows among rocks, at an altitude of 1000–2000 m.

MONTANA: Helena, 1892, *F. D. Kelsey;* Little Belt Mts., 1895, *Flodman, 525;* Elk Mts., *524;* Lewis & Clarke Co., *Mrs. Muth;* Rainbow Falls, 1888, *R. S. Williams, 46;* Judith Mts., 1882, *Canby;* Little Belt Mts., 1883, *Scribner, 52.*

* **Heuchera ovalifolia** Nutt.: Torr. & Gray, Fl. N. Am. **1**: 581.

Also a relative of *H. cylindrica*, but the plant is densely glandular all over and the leaves are rounded-elliptic, not heart-shaped, at the base. It is the commonest species in the region, growing on dry hills at an altitude of 1000–2000 m.

MONTANA: Silver Bow, 1895, *Rydberg, 2682;* Lima, *2680;* Bozeman, *2681;* Cottonwood Creek, 1896, *Flodman, 523;* Bridger Mts., June 15, 1897, *Rydberg & Bessey, 4298;* Jack Creek, July 14, *4299;* Spanish Basin, June 23–24, *4300;* Indian Creek, July 21, *4301;* Beaver Head Co., 1888, *Tweedy, 55;* Bear Creek, 1887, *258;* Virginia City, 1871, *Hayden.*

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy, 843;* Grand Cañon, 1872, *Coulter.*

Lithophragma tenella Nutt.: Torr. & Gray, Fl. N. Am. **1**: 584: *Tellima tenella* Wats. King's Exp. **5**: 95 [Man. R. M. 93; Bot. Cal. **1**: 198].

A very small plant, scarcely over 1 dm. high, and with a very small flower. The calyx is turbinate-campanulate, and the petals are wholly free from the ovary and divided into nearly filiform divisions. A very rare plant. Most specimens referred to it belong to the following:

YELLOWSTONE PARK: 1873, *C. C. Parry, 103*.

* **Lithophragma glabra** Nutt.; Torr. & Gray, Fl. N. Am. **1**: 584.

In this species the calyx is rounded-campanulate, nearly twice as large as in the preceding. The petals are also much larger, about as large as in the next, often rose-color and divided into linear lobes. The stem is taller than in the preceding, often over 2 dm. high. The taller specimens of *Tellima tenella* described by Coulter belong here. *L. glabra* grows in dry soil, at an altitude of 1000–2000 m.

MONTANA: Hell Gate, *John Pearsall, 811*: Lewis & Clarke Co., *Mrs. Fannie Harwood;* Bozeman, 1892, *W. T. Shaw*.

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy, 849*.

Lithophragma parviflora (Hook.) Nutt.: Torr. & Gray, Fl. N. Am. **1**: 584; *Tellima parviflora* Hook. Fl. Bor. Am. **1**: 239 [Man. R. M. 93; Bot. Cal. **1**: 198].

In this species the calyx is decidedly turbinate, and the lower portion is united with the ovary. It is rather common in the valleys, at an altitude of 1000–2500 m.

MONTANA: Helena, 1892, *F. D. Kelsey:* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4305:* Bridger Mts., June 10–14, *4306* and *4307;* Park Co., 1889, *Tweedy;* Great Falls, 1891, *R. S. Williams, 42: Nuttall:* Bozeman, 1883, *Scribner, 52c:* Stinking Water, 1871, *Hayden;* Grasshopper Valley, 1880, *Watson*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* 1885, *Tweedy, 850;* 1883, *Miss Mary Compton*.

* **Lithophragma Williamsii** (D. C. Eaton) Greene, Erythea, **3**: 102; *Heuchera Williamsii* D. C. Eaton, Bot. Gaz. **15**: 62 [**16**: 237].

In general appearance this does not resemble the other species. The crenate reniform leaves are not divided and resemble much those of some *Heucherae*. The petals are also undivided and small. The calyx, however, is that of a *Lithophragma*, resembling mostly that of the last species, being decidedly turbinate. It grows in meadows, at an altitude of 1500–2500 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 39; F. D. Kelsey;* Spanish Basin, 1896, *Flodman, 526;* Bridger Mts., June 12 and 17, 1897, *Rydberg & Bessey, 4302* and *4304;* Cedar Mts., July 16, *4303;* Monarch, 1890, *R. S. Williams, 179;* Nevada Creek, 1883, *Canby, 119;* Bozeman and Jefferson City, 1883, *Scribner, 52b;* Highwood Mts. and Belt Park, 1889, *R. S. Williams, 179.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Soda Butte, 1885, *Tweedy, 846.*

Mitella pentandra Hook. Bot. Mag. *pl. 2933* [Torr. & Gray, Fl. N. Am. **1**: 586: Man. R. M. 93; Bot. Cal. **1**: 200].

In springy or swampy places, especially in the woods, at an altitude of 1500–2500 m.

MONTANA: Park Co., 1887, *F. Tweedy, 266;* Melrose, 1895, *Rydberg, 2684;* Bozeman, *2683;* Spanish Basin, 1896, *Flodman, 528* and *529;* Bridger Mts., *530;* Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey, 4316;* Yogo, 1888, *R. S. Williams, 750;* Gallatin Co., 1886, *Tweedy, 1160;* Deer Lodge, *Miss Emma Ware;* Lake Plateau, 1897, *P. Koch, 16;* Prickly Pear Creek, 1883, *Scribner, 51c.*

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4315;* 1885, *Tweedy, 847.*

Mitella trifida Graham, Edinb. New Phil. Journ. **1829**: 185 [Torr. & Gray, Fl. N. Am. **1**: 587; Man. R. M. 93; Bot. Cal. **1**: 200].

Coulter describes the leaves of this species as being dentate, which is erroneous. They are on the contrary rounded-crenate. The calyx and corolla are both greenish white. It is a rather rare plant within the region, but more common west of the Rockies.

YELLOWSTONE PARK: 1873, *C. C. Parry, 102;* Mt. Washburn, 1884, *Tweedy, 242.*

* **Mitella violacea** Rydberg, Bull. Torr. Bot. Club, **24**: 248.

In habit and the form of the leaves, this species most resembles *M. pentandra.* The leaves are broadly cordate, slightly 5–7-lobed with rounded finely crenate lobes. It is easily distinguished from *M. pentandra* by the smaller flowers which are tinged and veined with violet, and by the petals which are oblanceolate, entire or slightly 3-cleft. It is rather common in southern Montana, at an altitude of about 2000 m., growing in wet meadows.

MONTANA: Spanish Basin, 1896, *Flodman, 527;* Bridger Mts., June 14–18, 1897, *Rydberg & Bessey, 4312, 4313* and *4314.*

* **Mitella Breweri** Gray, Proc. Am. Acad. **6**: 533 [Bot. Cal. **1**: 200].

Petals pinnately parted as in *M. pentandra*, but stamens opposite the sepals, and leaves round-reniform, crenate.

Woods.

MONTANA: Upper Marias Pass, 1883, *Canby, 118.*

* **Mitella nuda** L. Sp. Pl. 408 [Ill. Fl. **2**: 181].

A small plant with almost scape-like stem, reniform twice-crenate basal leaves, five stamens, and petals that divide pinnately into filiform segments. Not before reported from the northwestern United States.

MONTANA: St. Ignatius Mission, 1883, *Canby, 117.*

Tiarella unifoliata Hook. Fl. Bor. Am. **1**: 238 [Torr. & Gray, Fl. N. Am. **1**: 587; Man. R. M. 93; Bot. Cal. **1**: 199].

Rare, growing only in the western part of Montana.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 879;* Missoula, 1880, *Watson.*

PARNASSIACEAE.

Parnassia fimbriata Banks; Kon. & Sims, Ann. Bot. **1**: 391 [Torr. & Gray, Fl. N. Am. **1**: 150; Man. R. M. 95; Bot. Cal. **1**: 202].

Common in wet ground, at an altitude of 2000–2500 m.

MONTANA: Park Co., 1887, *F. Tweedy;* Little Belt Mts., 1896, *Flodman, 531;* Indian Creek, July 21, 1897, *Rydberg & Bessey, 4310;* Tiger Butte, 1886, *R. S. Williams, 191;* Deer Lodge, *Miss Emma Ware;* Gallatin Co., 1886, *Tweedy, 1159;* Flathead River, 1883, *Canby, 122.*

YELLOWSTONE PARK: 1885, *G. W. Letterman;* East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4311;* 1893, *Addison Brown;* 1884, *Tweedy, 239,* in part.

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 4309.*

Parnassia palustris L. Sp. Pl. 273 [Torr. & Gray, Fl. N. Am. **1**: 148; Man. R. M. 95; Bot. Cal. **1**: 202; Ill. Fl. **2**: 183].

Rare in swamps, at an altitude of over 2500 m.

MONTANA: West Boulder, 1887, *Tweedy, 260;* Hounds Creek, 1883, *Scribner, 53;* Blackfoot River, 1883, *Canby, 121.*

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy, 848;* 1884, *239*, in part.

Parnassia parviflora DC. Prod. **1**: 320 [Torr. & Gray, Fl. N. Am. **1**: 194; Man. R. M. 95; Ill. Fl. **2**: 183].

In swamps, at an altitude of 1000–2000 m.

MONTANA: Manhattan, 1895, *Rydberg, 2685;* East Gallatin Swamp, 1896, *Flodman, 532;* Meagher Co., 1892, *E. N. Brandegee;* Gallatin Co., *Mrs. Alderson;* Swimming Women Creek, 1882, *Canby;* Sixteen Mile Creek, 1882, *Scribner, 54.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 4308.*

HYDRANGEACEAE.

* **Philadelphus Lewisii** Pursh, Fl. Am. Sept. 329 [Torr. & Gray, Fl. N. Am. **1**: 595; Bot. Cal. **1**: 202].

A shrub about one meter high, with large white flowers, and green and glabrate ovate leaves, which are 3–5-nerved from the base. It grows on dry hillsides. The popular name is the same as that of its eastern congeners, viz., "Mock-orange" or "Syringa." Its flower is only a little smaller than that of the *P. coronarius* of the gardens.

MONTANA: Soap Gulch, Silver Bow Co., 1888, *Tweedy, 66;* Pony, July 6, 1897, *Rydberg & Bessey, 4317;* Western Montana, 1892, *Miss Emma Ware;* Belt Mts., 1891, *R. S. Williams, 678;* Gallatin Co., *Mrs. Hodgman;* Helena, 1894, *E. Douglass;* Gallatin Cañon, 1886, *Tweedy, 1161* and *1261;* Lone Gulch, 1888, *61;* Jocko River, 1883, *Canby, 123* and *124;* Helena, 1882, *Canby;* Bitterroot Cañon, 1880, *Watson.*

GROSSULARIACEAE.

* **Ribes setosum** Lindl. Trans. Hort. Soc. **7**: 243 [Ill. Fl. **2**: 188].

A gooseberry characterized by its cylindric calyx-tube, white petals, short stamens and generally numerous bristles on the stems and branches. The berry also is sometimes bristly. On hills, extending up to an altitude of 1500 m.

MONTANA: Helena, 1892, *Kelsey;* Bozeman, 1892, *W. T. Shaw* (with more slender corolla, perhaps distinct): Great Falls, 1886, *R. S. Williams, 398;* Bozeman, 1883, *Scribner, 54f;* Big Horn River, 1890, *J. W. Blankinship.*

YELLOWSTONE PARK: 1873, *Parry, 106.*

* **Ribes saxosum** Lindl.; Hook. Fl. Bor. Am. **1**: 231; *Ribes oxyacanthoides* Brew. & Wats. Bot. Cal. **1**: 206, mainly [Man. R. M. 96]; not L.; *R. oxyacanthoides saxosum* Coville, Contr. U. S. Nat. Herb. **4**: 100.

Differs from the eastern *R. oxyacanthoides* in the presence of stipular bristles on the petioles, glabrous leaves, and stouter but short spines.

MONTANA: Bridger Mts., 1896, *Flodman, 533; John Pearsall, 871*.

YELLOWSTONE PARK: Blacktail Deer Creek, 1884, *Tweedy, 240* and *241*.

* **Ribes leucoderme** Heller, Bull. Torr. Bot. Club, **24**: 92.

Nearly related to the two preceding; characterized by the white or yellowish-white bark on the twigs, and the weak prickles. In open woods, at an altitude of 2000–3000 m.

MONTANA: Bridger Mts., June 17, 1897, *Rydberg & Bessey, 4249;* Jack Creek, July 14, *4318*.

Ribes irriguum Dougl. Trans. Hort. Soc. **7**: 516; *Ribes divaricatum irriguum* Gray, Am. Nat. **10**: 273 [Man. R. M. 96; Bot. Cal. **1**: 206].

Mountains, up to an altitude of 2500 m.

MONTANA: Mill Creek, 1887, *Tweedy, 263;* Great Falls, 1886, *F. W. Anderson, 143:* Emigrant Gulch, Aug. 25, *4249a*.

Ribes inerme.

An apparently unarmed shrub of the *Grossularia* section, with reddish-brown bark, as in *R. cereum.* Leaves rounded-cordate, about 1 cm. in diameter, with short petioles, 3–5-cleft with rounded crenate lobes, glabrous and shining; raceme short, about equalling the leaves, 2–4-flowered: hypanthium tinged with yellow and rose-purple, turbinate, about 4 mm. long; sepals oblong, 2–3 mm. long, in anthesis reflexed, later descending; petals white or rose-color, rhombic-cuneate, about half as long as the sepals; filaments subulate, about equalling the sepals; styles distinct, with the lower portion bearded, a little exceeding the stamens.

It may have been mistaken for *R. oxyacanthoides*, but the form of the flower is different, and the leaves are much smaller, glabrous and shining. It was found at an altitude of about 2200 m.

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy, 830.*

* **Ribes echinatum** Lindl. Bot. Reg. **16**: *pl. 1349.*

Differs from *Ribes lacustre* in the less dissected leaves, longer racemes and the stem, which often lacks bristles or prickles; spines usually fewer and simpler. It occurs on wooded hillsides, while *R. lacustre* always grows in swamps.

MONTANA: Bridger Mts., June 18, 1897, *Rydberg & Bessey, 4250;* Grizzly Creek, 1887, *Tweedy, 262;* Belt Mountains, 1885, *F. W. Anderson, 144;* Priest's Pass, 1892, *F. D. Kelsey;* Bozeman, 1883, *Canby, 126;* Jefferson City, 1883, *Scribner, 54h;* Prickly Pear Cañon, *54g;* Missoula, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey, 4319;* Soda Butte, 1885, *Tweedy, 832; C. C. Parry, 105* (?).

Ribes parvulum (Gray); *Ribes lacustre parvulum* Gray, Bot. Cal. **1**: 206 [Man. R. M. 97].

Among rocks on the highest mountains, at an altitude of about 3000 m.

MONTANA: Little Rocky Mts., 1889, *Dr. V. Havard;* Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey, 4251;* Cedar Mts., July 16, *4252.*

YELLOWSTONE PARK: 1885, *Tweedy, 831.*

Ribes Hudsonianum Richards. Frank. Journ. Ed. 2, App. 6 [Man. R. M. 97; Ill. Fl. **2**: 190; Bot. Cal. **1**: 206].

On wooded hillsides, in damp places, up to an altitude of 2500 m.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Spanish Basin, 1896, *Flodman, 537;* Lewis and Clarke Co., *Mrs. E. Muth;* Priest's Pass, 1892, *F. D. Kelsey;* Jefferson City, 1883, *Scribner, 54c;* Priest's Pass, 1883, *Canby, 127;* Missoula, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: 1885, *Tweedy, 836.*

Ribes viscosissimum Pursh, Fl. Am. Sept. 163 [Man. R. M. 97; Bot. Cal. **1**: 207].

In woods, up to an altitude of 2000 m.

MONTANA: Bridger Mts., 1896, *Flodman, 538;* June 14, 1897, *Rydberg & Bessey, 4256;* Marysville, 1892, *Miss Ada Adams;* Prickly Pear Creek, 1883, *Scribner, 54e;* Odell's, 1880, *Watson.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1889, *E. A Mearns, 378;* 1873, *C. C. Parry, 108.*

Ribes floridum L'Her. Stirp. Nov. **1**: 4 [Man. R. M. 97; Ill. Fl. **2**: 191].

In open woods, on creek-banks, etc., up to an altitude of 2500 m.

MONTANA: Silver Bow Co., *Mrs. Moore:* Elliston, 1891, *Kelsey;* West Gallatin, 1883, *Scribner, 54b.*

YELLOWSTONE PARK: 1885, *F. Tweedy, 834.*

Ribes cereum Dougl. Trans. Hort. Soc. **7**: 512 [Man. R. M. 97; Ill. Fl. **2**: 191; Bot. Cal. **1**: 207].

In Coulter's Manual the calyx is described as rotate or saucer-shaped, while in fact it is elongated-cylindric. In the Botany of California it is also placed in a wrong division. *R. cereum* grows on dry hills, up to an altitude of 2500 m.

MONTANA: Indian Creek, July 21, 1897, *Rydberg & Bessey, 4320;* Bridger Mts., June 11 and 18, *4253* and *4255:* Spanish Basin, June 28, *4254;* Emigrant Gulch, Aug. 23, *4254a:* Gallatin Co., *Mrs. Alderson;* 1892, *W. T. Shaw;* Boulder River, 1888, *Tweedy, 60;* Gallatin Co., 1887, *264:* Great Falls, 1892, *R. S. Williams, 316;* Shield's River, 1883, *Scribner, 54d.*

YELLOWSTONE PARK: 1885, *Tweedy, 833.*

Ribes Nevadense Kell. Proc. Acad. Cal. **1**: 65: *Ribes sanguineum variegatum* Wats. King's Exp. **5**: 100 [Bot. Cal. **1**: 207; Man. R. M. 97].

In mountain woods: very rare.

MONTANA: Granite, 1892, *F. D. Kelsey.*

Ribes aureum Pursh, Fl. Am. Sept. 164 [Man. R. M. 98; Ill. Fl. **2**: 192; Bot. Cal. **1**: 207].

Along streams, up to an altitude of 2000 m.

MONTANA: Great Falls, 1891, *R. S. Williams, 4:* Missoula Co., *Mrs. Kennedy;* North Boulder River, 1888, *Tweedy, 59;* Bozeman, 1883, *Scribner, 54a.*

Ribes aureum chrysococcum Rydb. Fl. Neb. **21**: 71 [Ill. Fl. **2**: 192].

Fruit golden-yellow instead of black. Range the same as that of the species.

MONTANA: Jack Creek, July 19, 1897, *Rydberg & Bessey, 4257;* Bozeman, 1887, *Tweedy, 265.*

Ribes tenuiflorum Lindl. Trans. Hort. Soc. **7**: 242 [Torr. & Gray, Fl. N. Am. **1**: 552].

It differs from *R. aureum* in the very narrow calyx-tube and generally smaller leaves.

MONTANA: Helena, 1890, *F. D. Kelsey;* Sheridan, 1892, *H M. Fitch.*

ROSACEAE.

* **Opulaster pubescens.**

A shrub about 1 m. high with strict branches and light-colored shreddy bark; young branches, leaves and inflorescence pubescent with branched or stellate hairs; leaves orbicular with cordate base, slightly 5-lobed and doubly crenate, about 2 cm. long and 2–2.5 cm. in diameter; hypanthium and sepals densely stellate-tomentose, the latter ovate, obtuse: petals broadly obovate, about one-third longer than the sepals; ovaries densely stellate-tomentose, united to above the middle; carpels not much inflated, the apex straight or perhaps somewhat spreading in fruit.

In habit intermediate between *O. monogynus* and *O. pauciflorus*, but differs from both in the hairy and duller leaves and the obtuse sepals. The form of the carpels is intermediate, although more like the latter; the apex is straight and somewhat flattened laterally, but not so much as in those of *O. pauciflorus*; they are perhaps also more turgid than in that species. It grows at an altitude of 1500–2000 m.

MONTANA: Hound Creek, 1883, *Scribner, 35* (fruit, in Canby herbarium).

UTAH: Ogden, 1871, *T. C. Porter* (flowers, Columbia College).

WYOMING: Hartville, 1894, *A. Nelson, 498* (?) (this specimen seems to belong here, but carpels more divergent than in the types).

* **Opulaster pauciflorus** (Nutt.) Heller, Bull. Torr. Bot. Club, **25**: 581; *Spiraea pauciflora* Nutt.: Torr. & Gray, Fl. N. Am. **1**: 414; *Neillia malvacea* Greene, Pittonia, **2**: 30; *Opulaster malvaceus* Kuntze, Rev. Gen. Pl. 949.

In the form and size of the leaves this species is most like *O. opulifolius* but the fruit distinguishes it readily from that species and from *O monogynus.* The carpels are united to above the middle, are little inflated, and the upper portion is more or less laterally flattened and forms an erect beak. They are not, as described by Prof. Greene, indehiscent, but open very tardily; they are also much smaller than those of the other species. Nuttall's type is in the Columbia herbarium and belongs evidently to the same species as Prof. Greene's *Neillia malvacea. O. pauciflorus* is a native of the mountain regions of Washington, Oregon, northern Idaho and western Montana.

MONTANA: Spanish Basin, 1896, *Flodman*, *539* and *540*; Bridger Mts., June 17, 1897, *Rydberg & Bessey*, *4322*: Gallatin Co., *Mrs. Alderson*: Bear Creek, 1892, *W. T. Shaw*: Belt Mts., 1891, *R. S. Williams*, *756*; Sixteen Mile Creek, 1883, *Scribner*, *36*; Ross' Hole, 1880, *Watson*.

* **Spiraea Douglasii** Hook. Fl. Bor. Am. **1**: 172 [Bot. Cal. **1**: 169].

A species with rose-colored flowers and the lower surface of the leaves white-tomentose. In wet places: found only in the extreme western part of the state.

MONTANA: Lo-Lo Creek, 1880, *Watson*.

Spiraea lucida Dougl.; Hook. Fl. Bor. Am. **1**: 172; *Spiraea betulaefolia* Seringe; DC. Prod. **2**: 544 [Torr. & Gray, Fl. N. Am. **1**: 414; Man. R. M. 77; Bot. Cal. **1**: 169]: not Pall.

The true *S. betulaefolia*, as Prof. Greene has pointed out, is not found in North America, unless in Alaska where a few doubtful specimens have been collected. *S. betulaefolia* is a Siberian plant with much smaller thicker and rounder leaves than the American plant. Coulter gives the color of the flowers as pale purple. All I have seen, both in the field and in herbaria, have white flowers. In Torrey and Gray's Flora they are so described. *S. lucida* is common in woods throughout the mountain regions and ranges from an altitude of 1000–2500 m.

MONTANA: Spanish Basin, 1896, *Flodman*, *541*: Elk Mts., *542*: Jack Creek, July 15, 1897, *Rydberg & Bessey*, *4323*: Cedar Mts., July 16, *4324*: Electric Peak, Aug. 20, *4325*: Helena, 1890, *F. D. Kelsey*; Silver Bow Co., *Mrs. Moore*; Bear Creek, 1892, *W. T. Shaw*; Helena, 1894, *E. Douglass*; Spanish Creek, 1886, *Tweedy*, *1193*: Helena, 1891, *F. D. Kelsey*; Belt Mts., 1890, *R. S. Williams*, *176*; Smith River, 1883, *Scribner*, *34*: Ross' Hole, 1880, *Watson*.

YELLOWSTONE PARK: 1886, *Francis Hall*: Mammoth Hot Springs, 1884, *Tweedy*, *102*: Lower Falls, 1871, *Hayden*: 1873, *C. C. Parry*, *93*.

Spiraea densiflora Nutt.: Torr. & Gray, Fl. N. Am. **1**: 414; *Spiraea betulaefolia rosea* Coulter, Man. R. M. 77, in part.

MONTANA: Bridger Mts., 1896, *Flodman*, *543*: Little Belt Mts., *544*.

Petrophyton caespitosum (Nutt.); *Spiraea caespitosa* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 418 [Man. R. M. 77]; *Eriogynia caespitosa* Wats. Bot. Gaz. **15**: 242.

Watson, when reëstablishing the genus *Eriogynia* in the Botanical Gazette, divides it into three subgenera, which I regard as fully deserving the rank of genera. *Eriogynia* Hook. was based on *Saxifraga pectinata* (Pursh) Hook.: but as it is antedated by *Lutkea* of Bongard, the species mentioned becomes *Lutkea pectinata* (Pursh) Kuntze. As generic names for the other two species I adopt here the subgeneric ones used by Watson. *P. caespitosum* is a rather rare plant, growing on exposed rocks, at an altitude of about 2000 m.

MONTANA: Bridger Mts., June 18, 1897, *Rydberg & Bessey, 4321;* Gallatin Co., 1885, *Peter Koch;* 1886, *Tweedy, 1154;* Warm Spring Creek, Madison Co., 1887, *Tweedy, 6;* between Jefferson and Madison Rivers, 1871, *Hayden.*

* **Kelseya uniflora** (Wats.); *Eriogynia uniflora* Wats. Bot. Gaz. **15**: 242.

A cespitose woody plant of somewhat similar habit to the preceding, but still more compact; it has smaller leaves, and solitary subsessile flowers at the ends of the short branches, which are densely covered with the crowded leaves. It is named in honor of its discoverer, Rev. F. D. Kelsey, and has only been found at the original locality, so far as I know.

MONTANA: Gates of the Mountains, 1888 and 1892, *F. D. Kelsey.*

* **Holodiscus ariaefolia** (Smith) Greene, Man. Bay Reg. 113; *Spiraea ariaefolia* Smith; Rees. Cycl. **33**: No. 16; *Spiraea discolor ariaefolia* Wats. Bot. Cal. **1**: 170.

Resembles *H. discolor*, but has larger broadly ovate leaves, 5–10 cm. long, which are only slightly grayish (never white) tomentulose beneath. It is generally a shrub a meter or two, sometimes 3–4 m., high, while *H. discolor* scarcely reaches the height of a meter. It is found in the western part of Montana.

MONTANA: Columbia Falls, 1893, *R. S. Williams, 874;* Silver Bow Co., *Miss E. Hotchkiss;* Missoula, 1898, *Williams & Griffith.*

Rubus parviflorus Nutt. Gen. **1**: 308 [Ill. Fl. **2**: 199]; *Rubus Nutkanus* Moç.; DC. Prod. **2**: 566 [Torr. & Gray, Fl. N. Am. **1**: 450; Man. R. M. 79; Bot. Cal. **1**: 171].

Nuttall's name is a misnomer, as this species and *R. odoratus* have the largest flowers of all the North American species. It is not uncommon in open woods and on hillsides, at an altitude of 1000–2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 547:* Bridger Mts., June 14, 1897, *Rydberg & Bessey, 4326;* Emigrant Gulch, Aug. 23, *4327;* West Boulder, 1887, *Tweedy, 11:* Lewis and Clarke Co., *Mrs. E. Muth;* Bozeman Cañon, 1892, *W. T. Shaw;* Granite, 1892, *F. D. Kelsey;* Deep Creek, 1883, *Scribner, 46:* Ross' Hole, 1880, *Watson.*

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy, 477.*

Rubus nivalis Dougl.: Hook. Fl. Bor. Am. **1**: 181 [Man. R. M. 79].

According to Coulter, this should grow in the Bitterroot Mountains, but I have seen no specimens from there.

Rubus strigosus Michx. Fl. Bor. Am. **1**: 297 [Torr. & Gray, Fl. N. Am. **1**: 453: Man. R. M. 79; Ill. Fl. **2**: 200].

Common on rocky ground, up to an altitude of 2500 m.

MONTANA: South Fork of Judith River, 1896, *Flodman, 548:* Jack Creek, July 14, 1897, *Rydberg & Bessey, 4328:* Electric Peak, Aug. 20, *4329;* Emigrant Gulch, Aug. 23, *4330:* Spanish Basin, June 28, *4331:* Belt Mts., 1883, *Scribner, 47:* Sand Coulee, 1886, *F. W. Anderson.*

YELLOWSTONE PARK: Blacktail Deer Creek, 1884, *Tweedy, 95.*

* **Rubus leucodermis** Dougl.: Hook. Fl. Bor. Am. **1**: 178 [Torr. & Gray, Fl. N. Am. **1**: 454; Bot. Cal. **1**: 172].

It resembles *Rubus occidentalis*, but differs in the white bark of the young branches, the petals, which equal the sepals in length, and the brownish black fruit with a white bloom. *R. occidentalis* is apparently not found in Montana, and *R. leucodermis* only in the western portion of the state.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 875.*

Potentilla paradoxa Nutt.: Torr. & Gray, Fl. N. Am. **1**: 437 [Ill. Fl. **2**: 213; Rydb. Mon. 40*]; *Potentilla supina* Michx. Fl. Bor. Am. **1**: 304 [Man. R. M. 84].

Along streams in the eastern and northern parts of the state.

Potentilla rivalis Nutt.; Torr. & Gray, Fl. N. Am. **1**: 437 [Man. R. M. 83: Bot. Cal. **1**: 179; Rydb. Mon. 42].

Along rivers and in wet soil in the western portion of the state.

Potentilla leucocarpa Rydb.; Britton & Brown, Ill. Fl. **2**: 212 [Rydb. Mon. 43]; *Potentilla millegrana* Engelm.; Lehm. Ind Sem. Hort. Hamb. **1849**: 11; not Dougl.; *P. rivalis millegrana* Wats. Proc. Am. Acad. **8**: 553 [Man. R. M. 84: Bot. Cal. **1**: 178].

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* Rydberg, Monograph of the North American *Potentilleae* in Mem. Dep. Bot. Columbia Univ., Vol. 2.

Coulter describes it as "erect or weak and ascending." It is never as far as I know perfectly erect, but generally rather diffusely branched. The erect specimens that Dr. Coulter had in view must belong to the next species, which has been confused with it. *P. leucocarpa* grows in light rather damp soil, on prairies and river-bottoms. It is a rather rare plant in the region.

MONTANA: Helena, 1892, *F. D. Kelsey.*

* **Potentilla biennis** Greene, Fl. Fran. **1**: 65 [Rydb. Mon. 44]; *Potentilla lateriflora* Rydberg, Bull. Torr. Bot. Club, **23**: 261.

In habit it most resembles the following species, but is a much more slender plant, with a small falsely racemose inflorescence. It differs from *P. leucocarpa* in the erect subsimple stems, the broader leaflets, the inflorescence and the more glandular-puberulent stem.

In rich soil, at an altitude of 1000–2000 m.

MONTANA: Cliff Lake, July 27, 1897, *Rydberg & Bessey, 4372;* Pony Mts., July 7, *4371;* Melrose, 1895, *Rydberg, 2686;* Bozeman, 1887, *Tweedy, 16;* Helena, 1882, *Canby.*

Potentilla Monspeliensis L. Sp. Pl. 499 [Ill. Fl. **1**: 212; Rydb. Mon. 45]; *Potentilla Norvegica* Bigelow, Fl. Bost. 125 [Man. R. M. 83]; not L.

It is rather common in rich or sandy moist soil, reaching an altitude of about 2500 m.

MONTANA: Pony, July 6, 1897, *Rydberg & Bessey, 4367;* Cliff Lake, July 27, *4368;* Jack Creek, July 15, *4369;* Silver Bow Co., *Mrs. Moore;* Helena, 1892, *Kelsey.*

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 4370;* Yellowstone Lake, 1884, *Tweedy, 100.*

Potentilla concinna Richards. Frankl. 1st Journ. 739 [Rydb. Mon. 52]; *Potentilla humifusa* Nutt. Gen. **1**: 310 [Torr. & Gray, Fl. N. Am. **1**: 443; Man. R. M. 85].

A species belonging to the plains region, reaching an altitude of perhaps 2000 m.

MONTANA: Bozeman, 1892, *W. T. Shaw.*

Potentilla concinna divisa Rydberg, Bull. Torr. Bot. Club, **23**: 431 [Rydb. Mon. 53]; *Potentilla nivea dissecta* Wats. Proc. Am. Acad. 8: 559, in part [Man. R. M. 85, in part].

The Montana and Black Hills specimens, referred by Watson to his variety of *P. nivea*, belong to a form of *P. concinna*, which can easily be seen from the broad sepals and bractlets.

MONTANA: *Howard;* Bozeman Pass, 1883; *Scribner, 45c.*

Potentilla dissecta Pursh, Fl. Am. Sept. 355 [Torr. & Gray, Fl. N. Am. **1**: 446; Man. R. M. 85; Bot. Cal. **1**: 179; Rydb. Mon. 59].

In rocky places, at an altitude of 2000–3000 m.

MONTANA: Spanish Peaks, 1896, *Flodman, 573:* Pony Mts., July 7, 1897, *Rydberg & Bessey, 4386:* Spanish Basin, June 26, *4387:* Hell Roaring Creek, Park Co., 1887, *Tweedy, 13.*

YELLOWSTONE PARK: 1883, *Miss Mary Compton:* 1884, *Tweedy, 98;* 1885, *463.*

Potentilla dissecta glaucophylla (Lehm.) Wats. Proc. Am. Acad. **8**: 556 [Man. R. M. 85: Rydb. Mon. 61]; *Potentilla glaucophylla* Lehm. Del. Sem. Hort. Hamb. **1836**: 7.

On hillsides and in ravines, sometimes in the open valleys, at an altitude of 1500–2500 m. Occasionally it is even 5 dm. in height.

MONTANA: Spanish Basin, 1896, *Flodman, 574:* Bridger Mts., *575 (?);* Little Belt Mts., *576* and *578:* Elk Mts., *577;* Spanish Basin, July 1, 1897, *Rydberg & Bessey, 4389:* Belt Mts., 1883, *Scribner, 44.*

YELLOWSTONE PARK: 1884, *Tweedy, 96.*

Potentilla decurrens (Wats.) Rydberg, Bull. Torr. Bot. Club, **23**: 396 [Rydb. Mon. 61]: *Potentilla dissecta decurrens* Wats. Proc. Am. Acad. **8**: 557 [Man. R. M. 85].

It is more decidedly an alpine species than the preceding, growing among rocks, at an altitude of 2500–3000 m.

MONTANA: Little Belt Mts., 1896, *Flodman, 571;* Spanish Peaks, *572;* Bridger Mts., June 11 and 15, 1897, *Rydberg & Bessey, 4388* and *4393;* Pony, July 7, *4392:* Indian Creek, July 22, *4391.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4390.*

Potentilla multisecta (Wats.) Rydberg, Bull. Torr. Bot. Club, **23**: 397 [Rydb. Mon. 62]: *Potentilla dissecta multisecta* Wats. King's Exp. **5**: 86 [Man. R. M. 85].

A rare plant growing on the highest mountains, at an altitude of about 3000 m.

MONTANA: 1885, *F. W. Anderson, 125;* Lima, 1895, *Rydberg, 2691;* Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 4394.*

Potentilla fastigiata Nutt.; Torr. & Gray, Fl. N. Am. **1**: 440 [Rydb. Mon. 65]; *Potentilla gracilis fastigiata* Wats. Proc. Am. Acad. **8**: 557 [Man. R. M. 85; Bot. Cal. **1**: 179].

It most resembles *P. pulcherrima* in the form of the leaflets, but the plant is much lower, the cyme contracted and the leaves beneath less tomentose, never white.

It grows in dry places, at an altitude of 1500–2500 m.

MONTANA: *Nuttall;* West Gallatin, 1883, *Scribner, 45b.*

YELLOWSTONE PARK: 1893, *T. H. Burglehaus.*

Potentilla pulcherrima Lehm. Stirp. Pug. **2**: 10 [Rydb. Mon. 65]; *Potentilla Hippiana pulcherrima* Wats. Proc. Am. Acad. **8**: 555, in part [Man. R. M. 84, in part].

Watson evidently confused two somewhat similar, but apparently distinct plants. The true *P. pulcherrima* is a tall plant related to *P. gracilis*, with either digitate or closely pinnate leaves, the crenate leaflets white-tomentose beneath.

It grows in rich soil in open valleys, at an altitude of 2000–2500 m.

MONTANA: Bozeman Cañon, 1895, *Rydberg, 2693;* Bridger Mts., 1896, *Flodman, 562;* Little Belt Mts., *563;* Spanish Basin, June 26 and 28, 1897, *Rydberg & Bessey, 4373* and *4374;* Jack Creek, July 14, *4375;* Pony, July 6, *4380.*

* **Potentilla candida** Rydberg, Bull. Torr. Bot. Club, **24**: 6 [Mon. 67].

Similar to the preceding, but is a much lower plant with silvery-white crenate leaflets, their upper surface being white-silky, the lower silky and tomentose. It is an alpine plant, growing at an altitude of 2000–3000 m.

MONTANA: Deer Lodge, 1895, *Rydberg, 2688;* Lima, *2687;* Bridger Mts., June 10, 1897, *Rydberg & Bessey, 4377; F. W. Hayden,* 1860.

Potentilla Blaschkeana Turcz.; Lehm. in Otto, Gart. & Blumenz. **9**: 506 [Rydb. Mon., 69]; *Potentilla gracilis* Wats. Proc. Am. Acad. **8**: 557, in part [Man. R. M. 85]; not Lehm.

This has been regarded as *P. gracilis*, but is distinguished by the stouter habit, the large flowers, contracted cymes and the form of the leaflets. These are, in *P. Blaschkeana*, obovate or broadly oblanceolate in outline, divided half way to the midrib into oblong segments. In *P. gracilis* the leaflets are narrowly oblanceolate and with coarse triangular teeth; the leaves are white-tomentose beneath in both. *P. gracilis* is a native of the west coast and does not reach Montana. *P. Blaschkeana* grows in valleys at an altitude of 1000–2000 m.

MONTANA: Bozeman Cañon, 1895, *Rydberg, 2692;* Bozeman, 1896, *Flodman, 564;* Spanish Basin, June 23 and 28, *Rydberg & Bessey, 4378* and *4381;* Gallatin Co., 1887, *Tweedy, 64.*

YELLOWSTONE PARK: 1885, *Tweedy, 464.*

* **Potentilla viridescens** Rydberg, Mem. Dept. Bot. Columbia Univ. 2: 69.

Intermediate between the preceding and the following. In general habit it resembles the latter, but the leaves are slightly tomentose beneath, and the calyx more hairy. Its habitat is similar to that of the preceding.

MONTANA: Spanish Basin, 1896, *Flodman, 566;* Little Belt Mts., *567;* Pony, July 6, 1897, *Rydberg & Bessey, 4382;* Electric Peak, Aug. 18, *4376.*

YELLOWSTONE PARK: 1885, *Tweedy, 464.*

Potentilla Nuttallii Lehm. Ind. Sem. Hort. Hamb. **1852**: 12 [Rydb. Mon. 70]: *Potentilla gracilis rigida* Wats. Proc. Am. Acad. **8**: 557 [Man. R. M. 85: Bot. Cal. **1**: 179]; not *P. rigida* Wall.

Grows in the open valleys, at an altitude of 1000–2000 m.

MONTANA: Spanish Peaks, 1896, *Flodman, 565;* Spanish Basin, June 28, 1897, *Rydberg & Bessey, 4384;* July 1, *4383;* Jack Creek, July 14, *4385;* Cottonwood, 1892, *W. T. Shaw;* Bozeman, 1887, *Tweedy, 15;* Fort Ellis to Yellowstone, 1871, *R. Adams* (Hayden Survey).

YELLOWSTONE PARK: 1884, *Tweedy, 97.*

* **Potentilla pectinisecta** Rydberg, Bull. Torr. Bot. Club, **24**: 7 [Mon. 73].

Has the same habit as *P. candida* and *P. fastigiata*, but the leaves are deeply dissected into linear lobes; they are silky on both sides and only slightly tomentulose beneath. It is a rare plant, growing at an altitude of about 2000 m.

MONTANA: Spanish Basin, June 30, 1897, *Rydberg & Bessey, 4379;* 1871, *Robert Adams.*

Potentilla flabelliformis Lehm. Stirp. Pug. **2**: 12 [Rydb. Mon. 74]; *Potentilla gracilis flabelliformis* Torr. & Gray, Fl. N. Am. **1**: 440 [Man. R. M. 85: Bot. Cal. **1**: 179].

The leaves are divided to near the midrib into linear segments which are white-tomentose beneath and their margins are more or less revolute. The flowers are rather small and the branches of the cyme rather long. In open valleys, at an altitude of 1000–2000 m.

MONTANA: Manhattan, 1895, *Rydberg, 2694:* East Gallatin Swamps, 1896, *Flodman, 568:* Belt Park, 1889, *R. S. Williams, 171.*

* **Potentilla ctenophora** Rydberg, Mem. Dept. Bot. Columbia Univ. **2**: 75; *Potentilla flabelliformis ctenophora* Rydb. Bull. Torr. Bot. Club, **24**: 7.

Nearly related to the preceding and scarcely more than a variety of it. Differs in the larger flowers, more contracted cyme, and the broader segments of the leaves, the margins of which are not revolute. It approaches *P. Blaschkeana* in general habit. Open valleys, at an altitude of 1000–2000 m.

MONTANA: Bridger Mts., 1896, *Flodman, 569;* Elk Mts., *570;* Madison Co., *Mrs. McNulty.*

* **Potentilla quinquefolia** Rydberg, Mem. Dept. Bot. Columbia Univ. **2**: 76: *Potentilla nivea pentaphylla* Lehm. Stirp. Pug. **9**: 69; not *P. pentaphylla* Richt.

Most resembles *P. nivea* L. but the basal leaves are commonly 5-foliolate, with the middle leaflet more or less stalked. It is in our region a strictly alpine plant, growing at an altitude of 3000 m. or more, but in British America it occurs at much lower altitudes.

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 4397.*

* **Potentilla Hookeriana** Lehm. Ind. Sem. Hort. Hamb. **1849**: 10 [Rydb. Mon. 84].

Nearest related to *P. nivea*, but differs in the more deeply dissected leaves, the smaller flowers and the bractlets which equal the sepals.

MONTANA: 1883, *W. M. Canby, 103* (?).

Potentilla nivea L. Sp. Pl. 499 [Man. R. M. 85; Ill. Fl. **2**: 210; Rydb. Mon. 84].

No specimens have been seen from Montana, but it is found both north and south of the state and may be expected on the highest mountains.

* **Potentilla uniflora** Ledeb. Mem. Acad. St. Petersb. **5**: 543 [Rydb. Mon. 88].

A near relative of *P. nivea*, differing in the lower stem, larger flowers, and short cuneate more deeply dissected leaves. It grows on the tops of the highest mountains, at an altitude of 3000 m. or more.

MONTANA: 1883, *Canby, 104.*

Potentilla Pennsylvanica L. Mant. 76 [Torr. & Gray, Fl. N. Am. **1**: 438; Man. R. M. 84; Ill. Fl. **2**: 214; Rydb. Mon. 95].

A plant belonging to the Great Plains, ascending in the more open valleys to an altitude of 2000 m.

MONTANA: Spanish Basin, 1896, *Flodman, 552;* Cottonwood Creek, *553;* Cliff Lake, July 27, 1897, *Rydberg & Bessey, 4402;* Alhambra, 1892, *F. D. Kelsey.*

* **Potentilla Pennsylvanica arachnoidea** Lehm. Stirp. Pug. **9**: 41 [Rydb. Mon. 98].

This resembles var. *strigosa*, but has a finer pubescence and lacks the long hirsute hairs of that variety. It is a plant confined to the mountain regions, growing on hillsides and in valleys, at an altitude of 1500–2500 m. The variety *strigosa* is probably found in the eastern parts of the State, but I have seen no specimens.

MONTANA: Dear Lodge, 1895, *Rydberg, 2689;* Spanish Basin, 1896, *Flodman, 554;* Pony Mts., July 6, 1897, *Rydberg & Bessey, 4400;* Spanish Basin, July 1, *4401;* Beaver Head Co., 1888, *Tweedy, 44.*

Potentilla glabrella Rydb. Mem. Dept. Bot. Columbia Univ. **2**: 94; *Potentilla Pennsylvanica glabrata* Wats. Proc. Am. Acad. **8**: 554 [Man. R. M. 84]: not *P. glabrata* Lehm.

In the mountains, on dry soil.

MONTANA: 1890, *J. W. Blankenship, 62.*

* **Potentilla bipinnatifida** Dougl.: Hook. Fl. Bor. Am. **1**: 188 [Rydb. Mon. 99], *P. Pennsylvanica bipinnatifida* Torr. & Gray, Fl. N. Am. **1**: 438.

Resembles somewhat *P. Pennsylvanica* and has about the same distribution, but differs in the very narrowly linear segments of the leaves, which are silvery white, especially beneath.

MONTANA: Cottonwood Creek, 1896, *Flodman, 555;* Sheridan, 1892, *Mrs. Fitch.*

* **Potentilla pinnatisecta** (Wats.) Aven Nelson, Bull. Wyo. Agric. Exp. Sta. 28: 104 [Rydb. Mon. 106]; *Potentilla diversifolia pinnatisecta* Wats. King's Exp. **5**: 87.

A near relative of *P. Plattensis*, but differing in the erect flowering stems and the more numerous and coarser hairy leaves. *P. Plattensis* is a native of the valleys south of our range, while *P. pinnatisecta* is an alpine plant, growing at an altitude of 2500–3200 m.

MONTANA: Lima, 1895, *Rydberg, 2690;* Little Belt Mts., 1896, *Flodman, 549* and *550;* Spanish Peaks, *551;* Indian Creek, July 22, 1897, *Rydberg & Bessey, 4404;* East Boulder, 1887, *Tweedy, 17;* Yogo, 1888, *R. S. Williams, 753;* 1883, *Canby, 101.*

YELLOWSTONE PARK: Amethyst Mt., 1885, *Tweedy, 470.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4403.*

* **Potentilla Macounii** Rydb. Mem. Dept. Bot. Columbia Univ. **2**: 101.

Resembles the preceding species, but has broader leaflets, which are grayish or whitish silky and slightly tomentose beneath. It grows at an altitude of 3000 m. or more.

MONTANA: Little Belt Mts., 1896, *Flodman, 556;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4396;* Bridger Mts., June 10, *4395;* Helena, 1882, *F. Tweedy.*

Potentilla Hippiana Lehm. Nov. Stirp. Pug. **2**: 7 [Ill. Fl. **2**: 213; Man. R. M. 84; Rydb. Mon. 112].

This species belongs to the prairies and plains, perhaps reaching an altitude of 1500 m.

MONTANA: Silver Bow Co., *Mrs. Moore;* Great Falls, 1891, *R. S. Williams, 736.*

Potentilla Hippiana propinqua Rydb. Mem. Dept. Bot. Columbia Univ. **2**: 114; *Potentilla diffusa* Gray, Pl. Fendl. 41; not Willd.; *Potentilla Hippiana pulcherrima* Wats. Proc. Am. Acad. **8**: 555, in part [Coulter R. M. 84, in part].

This is a depauperate form of *P. Hippiana* with more crowded leaflets and a less dense pubescence on the upper surface of the leaves. It is a low plant with ascending stems, in habit much unlike *P. pulcherrima*, which it resembles in the form of the leaves. It is a comparatively rare plant, growing in dryer soil and perhaps extending farther up into the mountains.

MONTANA: Little Belt Mts., 1896, *Flodman, 559;* Cottonwood Creek, *560.*

Potentilla effusa Dougl.; Lehm. Nov. Stirp. Pug. **2**: 8 [Torr. & Gray, Fl. N. Am. **1**: 437; Man. R. M. 84; Ill. Fl. **2**: 214; Rydb. Mon. 114].

A plant growing on dry plains or hills, extending in the dryer valleys up to an altitude of about 2000 m.

MONTANA: Cottonwood Creek, 1896, *Flodman, 557;* Indian Creek, July 22, 1897, *Rydberg & Bessey, 4398;* Bridger Mts., June 14, *4399;* Little Rocky Mts., 1889, *Dr. Havard;* Bozeman, 1887, *Tweedy, 18;* Belt Mts., 1883, *Scribner, 43.*

Horkelia Gordonii Hook. Journ. Bot. & Kew Misc. 5: 341 [Rydb. Mon. 151]; *Ivesia Gordonii* Torr. & Gray, Pac. R. R. Rep. 6: 72 [Man. R. M. 86; Bot. Cal. 1: 183].

Horkelia and *Ivesia* have been distinguished by two characters, viz., dilated filaments and numerous pistils in *Horkelia* and filiform filaments and few pistils in *Ivesia*. These distinctions do not hold, however, as there are species in both genera which have dilated stamens and few pistils: it is, therefore, best to regard them as one genus. *Horkelia Gordonii* is a subalpine plant, growing at an altitude of 2000–3000 m.

MONTANA: Bridger Mountains, June 14–15, 1897, *Rydberg & Bessey*, *4349* and *4351*; Northern Montana, 1883, *F. W. Anderson*; Gallatin Co., *Mrs. Alderson*; Boulder Creek, 1883, *Scribner*, *45c*.

YELLOWSTONE PARK: 1884, *Tweedy*, *93*; Stinking Water, 1873, *C. C. Parry*, *96*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *4350*.

Argentina Anserina (L.) Rydberg, Mem. Dept. Bot. Columbia Univ. 2: 159: *Potentilla Anserina* L. Sp. Pl. 495; Torr. & Gray, Fl. N. Am. 1: 444 [Man. R. M. 86; Ill. Fl. 2: 216; Bot. Cal. 1: 180].

Argentina differs from *Potentilla* in the lateral style, the amphitropous, ascending ovules and the general habit. The genus was first separated by Lamarck in 1778, and was accepted by a subgenus by Torrey and Gray in 1840. *A. Anserina* grows in wet places, up to an altitude of perhaps 2500 m.

MONTANA: Lewis & Clarke Co., *Mrs. Muth*; Great Falls, 1892, *R. S. Williams*, *660*.

YELLOWSTONE PARK: 1884, *Tweedy*, *99* (a very slender, small-leaved and small-flowered form, with narrowly obovate petals, growing in brackish soil); 1885, *466*.

* **Argentina Anserina grandis** (Torr. & Gray) Rydb. Mem. Dept. Bot. Columbia Univ. 2: 161; *Potentilla Anserina grandis* Torr. & Gray, Fl. N. Am. 1: 444.

Leaves 3–4 dm. long, erect, the leaflets and flowers larger than in the species.

MONTANA: East Gallatin Swamps, 1896, *Flodman*, *580*; 1854, *Hayden*, *130*.

* **Comarum palustre** L. Sp. Pl. 502 [Torr. & Gray, Fl. N. Am. **1**: 447; Rydb. Mon. 162; Ill. Fl. **2**: 217]; *Potentilla palustris* Scop. Fl. Carn. Ed. 2, 359 [Bot. Cal. **1**: 180].

A swamp plant with dark green pinnate leaves, the leaflets oblong, purple acuminate petals, a somewhat fleshy receptacle in fruit, and lateral styles. It ascends up to an altitude of 2500 m.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 623*.

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 4344*.

Fragaria bracteata Heller, Bull. Torr. Bot. Club, **25**: 194 [Rydb. Mon. 175]; *Fragaria vesca* Hook. Fl. Bor. Am. **1**: 184, in part [Wats. King's Exp. **5**: 85; Man. R. M. 83; Bot. Cal. **1**: 177]; not L.

The European *F. vesca* is not a native of America and is only sparingly introduced in the East. It is replaced in America by two wild species: *F. Americana* (Porter) Britton, which grows from Newfoundland and Virginia to New Mexico, and may be found in the cañons of Eastern Montana; and *F. bracteata*, occurring from British Columbia and California to New Mexico. The former differ from *F. vesca* in being less hairy and having very thin leaves; both have the sepals reflexed in fruit. *F. bracteata* differs from both in the sepals, which are erect or merely spreading in fruit, and in the scape which nearly always bears an elliptic unifoliolate leaf. It is not uncommon in the mountain region, at an altitude of 1000–2000 m.

MONTANA: Jack Creek, July 14, 1897, *Rydberg & Bessey, 4332;* Bridger Mts., June 14–18, *4333, 4334* and *4335;* Spanish Basin, 1896, *Flodman, 592;* 1893, *Mrs. Moore;* Lo-Lo Cañon, 1880, *Watson, 112*, in part.

Fragaria platypetala Rydberg, Mem. Dept. Bot. Columbia Univ. **2**: 177; *Fragaria Virginiana Illinoensis* Wats. Bot. Cal. **1**: 177 [Man. R. M. 83]; not Gray.

The eastern variety to which this has been referred is found from Ohio to Kansas, and *F. platypetala* from British Columbia and California to Wyoming. The latter is to be distinguished by its very large petals, longer looser and fewer hairs and the more or less glaucous leaves; it differs from the next species by the spreading hairs of the scape. Extends up into the mountains to an altitude of 2500 m.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey, 4836;* Bridger Mts., June 14–17, *4337* and *4339;* 1894, *Mrs. Moore.*

Fragaria glauca (Wats.) Rydb. Bull. Torr. Bot. Club, **25**: 56 [Rydb. Mon. **2**: 183]; *Fragaria Virginiana* var. (?) *glauca* Wats. King's Exp. **5**: 85 [Man. R. M. 83].

Characterized by the appressed pubescence of the scape and the glaucous generally glabrate obovate leaflets. It ascends in the mountains to an altitude of 2500 m., growing in open places.

MONTANA: Bridger Mts., June 11, 1897, *Rydberg & Bessey, 4338;* Spanish Basin, June 28, *4341:* Sheridan, 1892, *Mrs. Fitch;* Gallatin Co., *Mrs. Alderson;* Park Co., 1887, *Tweedy, 2:* Missoula, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: Upper Geyser Basin, Aug. 8, 1897, *Rydberg & Bessey, 4340.*

* **Fragaria pauciflora** Rydberg, Mem. Dept. Bot. Columbia Univ. **2**: 183.

Differs from *F. glauca* in the few-flowered scape, the narrow cuneate leaflets and in the fruit, which is smaller and very deeply pitted, the pits large and fully twice as deep as the height of the achenes. It grows among bushes, at an altitude of 1500–2500 m.

MONTANA: Spanish Basin, 1895, *Flodman, 590:* Bozeman, *591:* Pony, July 7, 1897, *Rydberg & Bessey, 4343.*

YELLOWSTONE PARK: Upper Falls, Aug. 10, 1897, *Rydberg & Bessey, 4342.*

Sibbaldia procumbens L. Sp. Pl. 284 [Torr. & Gray, Fl. N. Am. **1**: 433; Man. R. M. 86; Ill. Fl. **2**: 217; Bot. Cal. **1**: 180: Rydb. Mon. 185].

In Montana a strictly alpine plant, growing at an altitude of over 3000 m.

MONTANA: Indian Creek, July 22, 1897, *Rydberg & Bessey, 4347;* Pony Mts., July 7, *4348:* Little Belt Mts., 1896, *Flodman, 579;* Gallatin Co., *Mrs. Alderson,* Belt Park, 1886, *R. S. Williams, 364;* Granite, 1892, *F. D. Kelsey,* Grizzly Creek, 1887, *Tweedy, 1;* Lake Plateau, 1897, *P. Koch, 60;* Belt Mts., 1883, *Scribner, 45 f,* McDonald's Peak, 1883, *Canby, 105.*

YELLOWSTONE PARK: 1884, *Tweedy, a;* Hoodoo Peak, 1897, *P. Koch, 12.*

Dasiphora fruticosa (L.) Rydb. Mem. Dept. Bot. Columbia Univ. **2**: 188; *Potentilla fruticosa* L. Sp. Pl. 495 [Man. R. M. 86; Ill. Fl. **2**: 215; Bot. Cal. **1**: 180].

The genus is distinguished from *Potentilla* by the club-shaped lateral style, hairy achenes, shrubby habit and adnate scarious stipules. It was treated as a subgenus under *Potentilla* by Torrey and Gray. In wet places, at an altitude of 2000 m.

MONTANA: Silver Bow Co., *Mrs. Moore;* Deer Lodge, 1891, *F. D. Kelsey;* Indian Creek, 1884, *Tweedy;* Teton River, 1883, *Scribner, 45.*

* **Dasiphora fruticosa tenuifolia** (Willd.) Rydb. Mem. Dept. Bot. Columbia Univ. 2: 190; *Potentilla tenuifolia* Willd.; Schlecht. Mag. Ges. Naturf. Fr. Berlin, 7: 284; *Potentilla fruticosa tenuifolia* Lehm. Monog. 31.

Leaflets narrow, more revolute; flowers smaller. It grows generally among rocks, but sometimes also in moist ground; it ascends in the mountains to an altitude of 3000 m.

MONTANA: Pony Mts., July 7, 1897, *Rydberg & Bessey, 4346;* Spanish Peaks, 1896, *Flodman, 581;* East Boulder, 1887, *Tweedy, 12.*

YELLOWSTONE PARK: 1883, *Miss Mary Compton;* Mammoth Hot Springs, 1897, *F. H. Burglehaus.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4345.*

Drymocallis arguta (Pursh) Rydberg, Mem. Dept. Bot. Columbia Univ. 2: 192; *Potentilla arguta* Pursh, Fl. Am. Sept. 736 [Ill. Fl. 2: 209; Torr. & Gray, Fl. N. Am. 1: 445; Man. R. M. 83].

The genus differs from *Potentilla* in the basal style, ascending and orthotropous seeds, stamens which are arranged in festoons on a thick fleshy disk, and flat anthers. *D. arguta* belongs to the Eastern United States and the prairie region, but a few specimens which must be referred to it have been collected in Montana. It is found in the valleys, not exceeding an altitude of 2000 m.

MONTANA: Northern Montana, *F. W. Anderson;* Bozeman, 1884, *Tweedy* (?).

* **Drymocallis convallaria** Rydberg, Mem. Dept. Bot. Columbia Univ. 2: 193; *Potentilla convallaria* Rydberg, Bull. Torr. Bot. Club, 24: 249.

Differs from *D. arguta* in the smaller flowers, elongated and more glandular inflorescence and less hairy foliage. From *D. glandulosa*, which it most resembles in habit, it is separated by the white or cream-colored petals and the narrow inflorescence. It grows in rich valleys at an altitude of 2000–3000 m.

MONTANA: Elk Mts., 1896, *Flodman*, *602*; Spanish Basin, *603*; Bozeman, *604*; Bridger Mts., *605*; Jack Creek, July 14–15, 1897, *Rydberg & Bessey*, *4352* and *4353*; Spanish Basin, June 23–28, *4354*, *4355*, *4356* and *4358*; Bridger Mts., June 17, *4357*; Bozeman, 1887, *Tweedy*, *12*: Smith River, 1883, *Scribner*, *42*.

* **Drymocallis pseudorupestris** Rydberg, Mem. Dept. Bot. Columbia Univ. **2**: 194; *Potentilla pseudorupestris* Rydberg, Bull. Torr. Bot. Club. **24**: 250: *Potentilla glandulosa Nevadensis* Wats. Bot. Cal. **1**: 178, in part.

Resembles somewhat the preceding, but the plant is low, only 1–3 dm. high, the cyme open, with ascending branches and few large white flowers, and the leaves small and very glandular. It is an alpine plant, growing at an altitude of 2500–3200 m.

MONTANA: Little Belt Mts., 1896, *Flodman*, *598*, *599* and *601*; Spanish Basin, *600*; Bridger Mts., June 15 and 18, 1897, *Rydberg & Bessey*, *4359* and *4361*; Pony, July 7, *4362*: Electric Peak, Aug. 18, *4364*; Spanish Basin, June 24, *4360*: Yogo, 1888, *R. S. Williams*, *754*; Gallatin Co., *Mrs. Alderson*: Deer Lodge, 1888, *F. D. Traphagen*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy*, *469*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *4363*.

* Drymocallis pseudorupestris intermedia.

Taller and less glandular than the species, sometimes 5 dm. high; growing at an altitude of about 2000 m.

MONTANA: Spanish Basin, 1896, *Flodman*, *597*: June 28, 1897, *Rydberg & Bessey*, *4365*.

* **Drymocallis glutinosa** (Nutt.) Rydb. Mem. Dept. Bot. Columbia Univ. **2**: 196; *Potentilla glutinosa* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 446.

Like *D. glandulosa*, but stouter and with much larger flowers. It belongs to the region west of the Rockies, but the following specimen is doubtfully referred here.

MONTANA: Bridger Mts., 1896, *Flodman*, *596*.

Drymocallis glandulosa (Lindl.) Rydberg, Mem. Dept. Bot. Columbia Univ. **2**: 198; *Potentilla glandulosa* Lindl. Bot. Reg. **19**: *pl. 1583* [Man. R. M. 83; Torr. & Gray, Fl. N. Am. **1**: 446].

Rather rare in valleys and on hillsides, at an altitude of about 2000 m.

MONTANA: Spanish Basin, July 28, 1897, *Rydberg & Bessey, 4366;* Granite, 1892, *F. D. Kelsey.*

YELLOWSTONE PARK: 1884, *Tweedy, 101.*

* **Drymocallis fissa** (Nutt.) Rydberg, Mem. Dept. Bot. Columbia Univ. **2**: 197: *Potentilla fissa* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 446.

Like *D. glandulosa*, but low, 2–3 dm. high, with a dense cyme and large flowers 15–20 mm. in diameter. It belongs mainly to a more southerly region; growing in the mountains at an altitude of over 2500 m.

YELLOWSTONE PARK: 1885, *C. W. Letterman, 136.*

Chamaerhodos erecta (L.) Bunge: Ledeb. Fl. Alt. **1**: 429 [Torr. & Gray, Fl. N. Am. **1**: 433; Man. R. M. 86: Rydberg, Mon. 205]; *Sibbaldia erecta* L. Sp. Pl. 284.

Dry plains, at an altitude of 1000–2000 m.

MONTANA: Park Co., 1889, *Tweedy;* Cottonwood Creek, 1896, *Flodman, 607;* Hounds Creek, 1883, *Scribner, 37;* Madison Valley, 1871, *Hayden.*

Geum strictum Ait. Hort. Kew. **2**: 207 [Torr. & Gray, Fl. N. Am. **1**: 421; Man. R. M. 82; Ill. Fl. **2**: 221].

Among bushes and in damp meadows, up to an altitude of 2500 m.

MONTANA: Cliff Lake, July 27, 1897, *Rydberg & Bessey, 4407;* Spanish Basin, June 23, *4406;* Cottonwood, 1892, *W. T. Shaw;* Swimming Women Creek, 1882, *Canby.*

* **Geum Oregonense** (Scheutz) Rydberg, Bull. Torr. Bot. Club, **25**: 56; *Geum urbanum Oregonense* Scheutz, Nov. Act. Soc. Sci. **7**: 26.

In habit intermediate between *G. macrophyllum* and *G. strictum;* differs from both in its smaller and lighter yellow petals, smaller heads of achenes and glandular-puberulent lower portion of the styles. It is the most common species in Montana, growing in meadows up to an altitude of 2700 m.

MONTANA: Cliff Lake, July 27, 1897, *Rydberg & Bessey, 4412;* Bridger Mts., June 10–18, *4410* and *4411;* Spanish Basin, June 28, *4409;* Jack Creek, July 15, *4408;* Deer Lodge, *Miss Emma Ware;* Bozeman, 1887, *Tweedy, 7;* Smith River, 1883, *Scribner, 39.*

YELLOWSTONE PARK: Tower Falls, 1885, *F. Tweedy.*

Geum rivale L. Sp. Pl. 501 [Torr. & Gray, Fl. N. Am. **1**: 422; Man. R. M. 82; Ill. Fl. **2**: 219].

In swamps up to an altitude of 2500 m.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey, 4413;* 1896, *Flodman, 610;* Bozeman, 1886, *Tweedy, 1187* (perhaps a hydrid with *G. Oregonense*); Deer Lodge, *Miss E. Ware;* Neihart, 1886, *R. S. Williams, 47;* Jefferson City, 1883, *Scribner, 40 b;* Ross' Hole, 1880, *Watson.*

Sieversia ciliata (Pursh) G. Don. Gard. Dict. **2**: 528; *Geum ciliatum* Pursh, Fl. Am. Sept. **1**: 352 [Torr. & Gray, Fl. N. Am. **1**: 425; Ill. Fl. **2**: 219]; *Geum triflorum* Pursh, Fl. Am. Sept. **2**: 736 [Torr. & Gray, Fl. N. Am. **1**: 423; Man. R. M. 82; Bot. Cal. **1**: 176].

Common throughout the mountain regions, growing most commonly on hillsides, at an altitude of 1000–1300 m.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Little Belt Mts., 1896, *Flodman, 609;* Bridger Mts., June 11, 1897, *Rydberg & Bessey, 4415;* Jack Creek, July 14, *4414;* Butte, 1896, *J. F. Kemp;* Helena, 1892, *Kelsey;* Bozeman Pass, 1883, *Scribner, 40a.*

YELLOWSTONE PARK: 1886, *Francis Hall;* 1883, *Miss Mary Compton;* 1885, *Tweedy, 474; Miss Frances Hobson.*

Sieversia turbinata (Rydb.) Greene, Pittonia, **4**: 50; *Geum turbinatum* Rydberg, Bull. Torr. Bot. Club, **24**: 91; *Geum Rossii* Torr. & Gray, Fl. N. Am. **1**: 424, in part [Man. R. M. 82].

Neither *S. Rossii* nor *humilis* are found in the Rocky Mountains. The former is an Arctic plant and the latter has only been collected on the island of Unalaska. *S. turbinatum* differs in the turbinate hypanthium (so-called calyx) and the much smaller flowers. It is an alpine or subalpine plant, growing among rocks on the mountain sides, at an altitude of 2500–3500 m. In the subalpine regions it often becomes 2–3-flowered and fully 2 dm. high; on the highest mountain top it is only a few cm. high and always one-flowered.

MONTANA: Spanish Peaks, 1896, *Flodman, 608;* Old Hollowtop, Pony Mts., July 9, *Rydberg & Bessey, 4417;* Indian Creek, July 24, *4416;* Mt. Blackmore, 1886, *Tweedy, 1194;* Hell Roaring Creek, Park Co., 1887, *Tweedy, 9;* McDonald's Peak, 1883, *Canby, 99;* Belt Mts., 1883, *Scribner, 40;* Odell's, 1880, *Watson, 110;* Belt Mts., 1883, *Canby, 40.*

Cercocarpus parvifolius Nutt.; Hook. & Arn. Bot. Beechey's Voy. 337 [Man. R. M. 81; Ill. Fl. **2**: 223; Bot. Cal. **1**: 175].

No specimens from Montana have been seen by the author, but the species is common in the Black Hills and northern Wyoming and is probably to be found in the Little Missouri region of the state.

Cercocarpus ledifolius Nutt.; Torr. & Gray, Fl. N. Am. **1**: 427 [Man. R. M. 80; Bot. Cal. **1**: 174].

On dry hillsides and mountains, at an altitude of 2000–3000 m. A shrub, 2–5 m. high, with very hard wood. It is known as "Mountain Mahogany."

MONTANA: Madison Co., 1888, *Tweedy*, *47;* Ennis, 1886, *1192;* Helena, 1892, *Kelsey*, Madison River, 1883, *Scribner*, *37b*.

* **Cercocarpus intricatus** Wats. Proc. Am. Acad. **10**: 346.

Like the preceding, but a low intricately branched shrub with narrowly linear strongly revolute leaves. It grows on dry hills, at an altitude of about 2000 m.

MONTANA: Melrose, 1895, *Rydberg*, *2695*.

Dryas octopetala L. Sp. Pl. 501 [Torr. & Gray, Fl. N. Am. **1**: 420; Man. R. M. 81; Ill. Fl. **2**: 222].

An alpine plant, growing on the tops of the highest peaks, at an altitude of over 3000 m.

MONTANA: Old Hollowtop, Pony Mts., July 9, 1897, *Rydberg & Bessey*, *4418;* East Boulder, 1887, *Tweedy*, *3;* Beaver Head Creek, 1888, *94;* McDonald's Peak, 1883, *Canby*, *97*.

YELLOWSTONE PARK: Mt. Holmes, 1884, *F. Tweedy*, *94*.

* **Dryas Drummondii** Richards.; Hook. Bot. Mag. *t. 2972* [Torr. & Gray, Fl. N. Am. **1**: 420; Ill. Fl. **2**: 223].

Resembles much the preceding species, but has yellow petals and ovate sepals, which are densely black-hairy. At an altitude of 1200–3000 m.

MONTANA: Belt Mts., 1886, *F. W. Anderson*, *117;* Blackfoot River and Flathead River, 1883, *Canby*, *26;* Flathead River, 1861, *Lyall*.

Kunzia tridentata (Pursh) Spreng.; Steud. Nom. **1**: 669; *Tigarea tridentata* Pursh, Fl. Am. Sept. 33; *Purshia tridentata* DC. Trans. Linn. Soc. **12**: 158 [Torr. & Gray, Fl. N. Am. **1**: 428; Man. R. M. 80; Bot. Cal. **1**: 173].

Grows on dry hills, at an altitude of 1500–2500 m.

MONTANA: Willow Creek, Madison Co., July 14, 1897, *Rydberg & Bessey*, *4419;* Deer Lodge, 1888, *F. W. Traphagen;* Madison

River, 1886, *Tweedy*, *1195;* Big Pipestone Creek, 1888, *48;* Lewis and Clarke Co., *Mrs. Muth;* Priest's Pass, 1892, *F. D. Kelsey;* Tenderfoot, 1891, *R. S. Willams*, *852;* Priest's Pass, 1883, *Canby*, *98;* Boulder Creek, 1883, *Scribner*, *37a;* 1861, *Dr. Lyall.*

Agrimonia hirsuta (Muhl.) Bicknell, Bull. Torr. Bot. Club, **23**: 509 [Ill. Fl. **2**: 226]: *Agrimonia Eupatoria hirsuta* Muhl. Cat. 47; *Agrimonia Eupatoria* Walt. Fl. Car. 131 [Man. R. M. 87; Bot. Cal. **1**: 185]; not L.

Among bushes, up to an altitude of 1500 m.

Montana: Belt Mountains, near Hound Creek, 1883, *Scribner*, *38.*

Rosa Arkansana Porter, Fl. Colo. 38 [Wats. Proc. Am. Acad. **20**: 341; Man. R. M. 87; Ill. Fl. **2**: 230].

R. Arkansana differs from the two related species in the sepals which are reflexed (but not deciduous) in fruit. It belongs to the prairie and plains regions, ascending in the valleys to an altitude of nearly 2000 m.

Montana: Park Co., 1889, *Tweedy;* Bozeman, 1886, *Tweedy*, *1186;* Frenchman's Creek, *Coues;* Upper Yellowstone, *Allen;* Nevada Creek, *Sargent;* Hound Creek, *Scribner*, *48.*

Rosa Sayi Schwein; Long's Exp. Winnep. **2**: 388 [Wats. Proc. Am. Acad. **20**: 340 [Man. R. M. 87].

The fruit of this species is almost as large as that of *R. Nutkana*, which this species most resembles, but is easily distinguished by the thinner leaves, the absence of infrastipular spines and the usual presence of numerous bristles, especially on the young shoots. Unlike *R. Arkansana*, it nearly always grows among trees or shrubs; reaches an altitude of almost 3000 m.

Montana: South Fork of Judith River, 1895, *Flodman*, *612;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey*, *4425;* Bridger Mts., June 17, *4426;* Spanish Basin, June 28, *4424;* Jack Creek, June 14, *4423;* Lewis and Clarke Co., *Mrs. Muth;* Madison Co., 1888, *Tweedy*, *46;* Trail Creek, 1887, *19a;* Belt Mts., 1890, *R. S. Williams*, *752;* Helena, 1892, *Mrs. Muth;* Bozeman, 1883, *Canby*, *108;* Helena, 1882, *Canby.*

Yellowstone Park: Mammoth Hot Springs, 1893, *Addison Brown;* 1885, *Tweedy*, *471* and *472.*

Rosa Nutkana Presl, Epim. 203 [Wats. Proc. Am. Acad. **20**: 341; Man. R. M. 88; Bot. Cal. **2**: 444].

This is recognized by its large flowers, stout spines, doubly serrate firm leaves and large fruit. It nearly always grows in open woods, at an altitude of 1000–2500 m.

MONTANA: South Fork of Judith River, 1896, *Flodman, 613;* Bridger Mts., June 17, 1897, *Rydberg & Bessey, 4421;* Park Co., 1889, *Tweedy;* Flathead Lake, 1883, *Canby, 108*, in part.

* **Rosa MacDougali** Holz. Bot. Gaz. **21**: 36; *Rosa Nutkana hispida* Fernald, Bot. Gaz. **19**: 335; not *R. hispida* Moench.

Nearest related to *R. Nutkana*, but the fruit is somewhat smaller, the peduncle densely bristly and the infrastipular spines much smaller and more like those of the next species.

MONTANA: Rock Creek, in the Bitter Root Valley, 1880, *Watson, 124;* Bozeman, *Koch.*

Rosa Woodsii Lindl. Ros. Monog. 21 [Torr. & Gray, Fl. N. Am. 460; *R. Woodsii* and *R. Fendleri*, in part, Wats. Proc. Am. Acad. **20**: 344–5 [Man. R. M. 88; Ill. Fl. **2**: 230].

It is evident that what Watson and Coulter regarded as *R. Fendleri* is the true *Rosa Woodsii.* If *R. Fendleri* Crepin is distinct, it is a species of the Southwest and not found in Montana. Watson's character for *R. Woodsii*, "outer sepals laterally lobed," fails, as this occurs occasionally in all the roses of the *Cinnamomiae* group. Lindley in the original description of *R. Woodsii* states that they are entire. In western Nebraska there is a form of *R. Woodsii*, or a related species, with larger yellow fruit and more pubescent leaves, which I formerly regarded as *R. Woodsii*, but a comparison with Lindley's description and plate has persuaded me that the form with small red fruit and nearly glabrate leaves is the true *R. Woodsii.* The form with larger yellow fruit, if distinct, should bear the name *R. Maximiliani* Nees. Watson's *R. Woodsii* probably comprises forms of both, as well as of some of the other *Cinnamomiae. Rosa Woodsii* grows along streams, up to an altitude of 2000 m.

MONTANA: Spanish Basin, June 23, 1897, *Rydberg & Bessey, 4420;* Beaver Head Co., 1888, *Tweedy, 45;* Fridley, 1887, *19;* Lewis and Clarke Co., *Mrs. Muth:* Silver Bow Co., *Mrs. Helen Dolman;* Helena, 1888, 1891–92, *F. D. Kelsey;* Great Falls, 1892, *R. S. Williams, 659:* Beaver Head Co., 1888, *F. Tweedy, 45;* Bitter Root Valley, 1880, *Watson;* Tongue River, *Roberts;* Grasshopper Valley, *Watson;* Miles City and Snowy Mountains, 1882, *Canby;* Gallatin City, 1883, *Scribner, 48a;* Judith River, 1882, *Springer, XXXVIII.*

Rosa gymnocarpa Nutt; Torr. & Gray, Fl. N. Am. **1**: 461 [Wats. Proc. Am. Acad. **20**: 350; Man. R. M. 88; Bot. Cal. **1**: 187].

Found only in the western part of Montana.

MONTANA: Columbia Falls, 1892, *R. S. Williams:* Bitter Root River, 1880, *Watson:* Flathead Lake, *Sargent:* Flathead River, 1883, *Canby*, *107*.

DRUPACEAE.

Prunus Americana Marsh. Arb. Am. 111 [Man. R. M. 76: Ill. Fl. **2**: 247].

Along streams in the eastern part of the state, reaching an altitude of 1500 m.

* Prunus corymbulosa.

A small shrub, 1–2 m. high: bark dark brown, shining, more or less dotted with lenticels; leaves glabrous and shining, 4–6 cm. long, ovate-lanceolate, acute or acuminate, finely crenate with mucronulate teeth: flowers appearing with the leaves, in small 3–6-flowered corymbs, which are often subtended by one or two small leaves; sepals broadly obovate or rounded, more or less wavy and erose; petals broadly obovate, about 4 mm. long, more or less wavy-margined.

In foliage it is strikingly like *P. Pennsylvanica*, but differs in the inflorescence, which is more like that of *P. mollis*. All specimens seen were small shrubs, scarcely over 1 m. high; only one was found in bloom. The leaves generally have a pair of small glands at the base of the blade. Specimens of this species, when not in flower or fruit, might be mistaken for the dwarf Rocky Mountain form of *P. Pennsylvanica*.

MONTANA: Bridger Mountains, June 18, 1897, *Rydberg & Bessey*, *4437:* Little Rocky Mountains, *Dr. V. Havard*.

Prunus demissa (Nutt.) Walp. Rep. **2**:10 [Man. R. M. 77; Ill. Fl. **2**: 253; Bot. Cal. **1**: 167]; *Cerasus demissa* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 44.

Rather common in cañons and valleys, at an altitude of 1000–2500 m.

MONTANA: Madison Co., 1888, *F. Tweedy*, *93;* Spanish Basin, June 26, 1897, *Rydberg & Bessey*, *4436;* Emigrant Gulch, Aug. 23, *4435:* Bridger Mts., June 12 and 18, *4433* and *4434:* Great Falls, 1892, *R. S. Williams*, *392:* Helena, 1882, *Kelsey:* Madison

Co., 1888, *Tweedy, 93;* Lewis and Clarke Co., *Mrs. Muth:* Gallatin Co., *Mrs. Alderson;* Swimming Women Creek, 1883, *Canby;* Missoula, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: 1888, *Dr. C. H. Hall:* Tower Falls, 1885, *Tweedy, 475.*

POMACEAE.

Sorbus sambucifolia (Cham. & Schlecht.) Roem. Fam. Nat. Syn. **3**: 39 [Ill. Fl. **2**: 233]; *Pyrus sambucifolia* Cham. & Schlecht. Linnaea, **2**: 36 [Torr. & Gray, Fl. N. Am. **1**: 472; Man. R. M. 89; Bot. Cal. **1**: 189].

In cañons and on hillsides in the mountain regions, at an altitude of 1000–2500 m.

MONTANA: Bridger Mts., 1896, *Flodman, 546;* June 14 and 18, 1897, *Rydberg & Bessey, 4427* and *4428;* Neihart, 1891, *R. S. Williams, 851;* Bozeman, 1892, *W. T. Shaw;* Torn Miner Creek, 1887, *Tweedy, 4;* Prickly Pear Creek, 1883, *Scribner, 49a.*

Crataegus rivularis Nutt.; Torr. & Gray, Fl. N. Am. **1**: 464 [Man. R. M. 88; Bot. Cal. **1**: 189].

A rather rare plant growing in cañons, at an altitude of 1500–2500 m.

MONTANA: Priest's Pass, 1892, *F. D. Kelsey* (small-leaved form); Flathead River, 1883, *Canby, 110.*

Crataegus brevispina Dougl.; Steud. Nom. Ed. 2, **1**: 432; *Crataegus punctata β brevispina* Dougl. in Hook. Fl. Bor. Am. **1**: 201; *Crataegus Douglasii* Lindl. Bot. Reg. *t. 1810* [Man. R. M. 88; Bot. Cal. **1**: 189].

The most common of the hawthorns in Montana, growing on river banks, in cañons, etc., at an altitude of 1000–2500 m.

MONTANA: Bozeman, 1886, *F. Tweedy, 1190* and *1191;* Gallatin Co., *Mrs. Alderson;* Bozeman Cañon, 1892, *W. T. Shaw;* Lewis and Clarke Co., *Mrs. E. Muth:* Deep Creek, 1890, *R. S. Williams, 532;* Bozeman, 1883, *Canby, 109.*

(?)**Crataegus coccinea** L. Sp. Pl. 476 [Torr. & Gray, Fl. N. Am. **1**: 465; Man. R. M. 89; Ill. Fl. **2**: 242].

In the specimens seen from Montana the leaves have less pointed teeth and are more puberulent, and the fruit is smaller than in the eastern tree. It may be a distinct species. Apparently the same form was collected by me in the sand hills of Nebraska in 1893, no. *1528.*

MONTANA: Great Falls, 1886, *R. S. Williams, 531.*

* **Crataegus macracantha** Lodd; Loudon, Arb. Brit. Ed. 2, **2**: 819 [Ill. Fl. **2**: 243].

Resembles *C. coccinea*, but has generally broader leaves, which are subcordate at the base, and very large thorns 5–10 cm. long. It belongs rather to the prairie region, but extends up in the mountains to an altitude of 2000 m.

MONTANA: Bozeman, 1886, *P. Koch, 1188* and *1189;* 1886, *Tweedy;* Park Co., 1887, *Tweedy, 10;* Great Falls, 1886, *F. W. Anderson, 133.*

*(?)**Crataegus flabellata** (Spach); *Mespilus flabellata* Spach, Hist. Veg. **2**: 63; *Crataegus coccinea flabellata* Britton, Mem. Torr. Bot. Club, **5**: 183 [Ill. Fl. **2**: 242].

Nearest related to *C. coccinea*, but differs in the form and serration of the leaves, which are cuneate at the base, sharply incised and thick and shining when old. One specimen that apparently belongs here has been collected in western Montana.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 877.*

* **Crataegus tomentosa** L. Sp. Pl. 476 [Ill. Fl. **2**: 244].

Resembles *C. macracantha* and *C. coccinea*, but the leaves are oval and more or less pubescent beneath.

MONTANA: Dearborn River, 1883, *Scribner, 49.*

Amelanchier alnifolia Nutt. Jour. Phila. Acad. Sci. **7**: 22 [Man. R. M. 89; Ill. Fl. **2**: 239; Bot. Cal. **1**: 190]; *Aronia alnifolia* Nutt. Gen. **1**: 306.

The description of this species is somewhat vague in Coulter's Manual probably owing to the fact that it covers the next two species and perhaps also *A. Utahense.* The leaves of *A. alnifolia* are always thin, broadly elliptic or rounded, often subcordate at the base and generally truncate at the apex, serrate only on the upper half, and glabrate or nearly so. It is a shrub 2–5 m. high, growing in cañons, up to an altitude of 2500 m.

MONTANA: Helena, 1889, *F. D. Kelsey;* Spanish Basin, 1896, *Flodman, 545;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 4432;* Bridger Mts., June 14, *4431;* Picnic Cañon, Helena, 1892, *Brandegee;* Deer Lodge, *Emma Ware.*

* **Amelanchier pumila** Nutt.; Torr. & Gray, Fl. N. Am. **1**: 474, as synonym; *Amelanchier Canadensis ε pumila* Torr. & Gray l. c.

A low bush, 1–2 meters high, with rounded thick leaves, which are sharply serrate all around and glabrous. Grows on dry hillsides, at an altitude of about 2000 m.

MONTANA: Bridger Mts., June 18, 1897, *Rydberg & Bessey, 4430.*

* **Amelanchier florida** Lindley, Bot. Reg. *t. 1589; Amelanchier ovalis β semi-integrifolia* Hook. Fl. Bor. Am. **1**: 202.

It is probable that Hooker's name is slightly older. His Flora was issued in parts; the first volume was issued between 1830 and 1833, but the exact date I cannot ascertain. The plate 1589 of the Botanical Register was published in June, 1833. *Amelanchier florida* resembles *A. alnifolia* in size, but the leaves are narrower, oblong or oval, serrate only at the apex and white woolly when young. It grows at an altitude of 1000–2500 m.

MONTANA: Forks of Madison, July 27, 1897, *Rydberg & Bessey, 4429;* Great Falls, 1892, *R. S. Williams, 385;* Sheridan, 1892, *H. M. Fitch.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall.*

* **Amelanchier Utahense** Koehne, Berlin Oestern. **32**: 2.

Like *A. alnifolia*, but with smaller thicker and tomentose leaves. It grows in the mountains, at an altitude of 2000–2500 m.

MONTANA: Fort Ellis to Yellowstone, 1871, *Robert Adams.*

PAPILIONACEAE.

Thermopsis rhombifolia (Nutt.) Richardson, Frankl. Jour. App. 737 [Man. R. M. 52; Ill. Fl. **2**: 265]; *Cytisus rhombifolia* Nutt. Frazer's Cat.

On dry sunny plains, up to an altitude of 1500 m.

MONTANA: Sand Coulee, *F. W. Anderson, 76;* Great Falls, 1891, *R. S. Williams, 101;* Lewis and Clarke Co., *Mrs. Fannie Harwood;* Custer Co., 1892, *Mrs. Light.*

Thermopsis montana Nutt.; Torr. & Gray, Fl. N. Am. **1**: 388 [Man. R. M. 52; Bot. Cal. **1**: 114].

In rich meadows throughout the mountain regions, up to an altitude of 2500 m. It is regarded as a forage plant, making fairly good hay if cut young.

MONTANA: Port Benton, *John Pearsall, 923* (Lt. Mullan's Exped.); Helena, 1891, *F. D. Kelsey;* Melrose, 1895, *C. L. Shear, 544;* Beaver Head Co., 1888, *Tweedy, 211; Mrs. Ames; Mrs. Bartlet;* Ennis, 1886, *Tweedy, 1071;* East Gallatin Swamps, 1896, *J. H. Flodman, 614;* Pony, July 8, 1897, *Rydberg & Bessey, 4438;* Madison River, 1883, *Scribner, 19b;* Grasshopper Valley, 1880, *Watson.*

* **Lupinus polyphyllus** Lindl. Bot. Reg. 1096 [Bot. Cal. **1**: 117; Wats. Rev. 524 *].

Like *L. Burkei*, but with longer petioles and short deciduous bracts. Only in the western part of the state.

MONTANA: Flathead Lake, 1883, *Canby, 66;* Blackfoot River, *65.*

* **Lupinus Wyethii** Wats. Proc. Am. Acad. **8**: 525.

Like *L. Burkei* and *L. polyphyllus*, but with ascending less leafy stem and setaceous stipules.

MONTANA: Flathead, *Wyeth;* Sun River, 1883, *Scribner, 20.*

Lupinus Burkei Wats. Proc. Am. Acad. **8**: 525 [Man. R. M. 53; Bot. Cal. **1**: 118].

In damp places among bushes, on creek banks, etc., in the mountain region, at an altitude of 1500–2500 m.

MONTANA: Silver Bow Co., *Mrs. Jennie Moore;* Spanish Basin, 1896, *J. H. Flodman, 618;* June 26, 1897, *Rydberg & Bessey, 4439;* Lo-Lo, 1880, *Watson.*

YELLOWSTONE PARK: Turbid Lake, 1885, *Tweedy, 543;* Falls, 1871, *R. Adams.*

Lupinus leucophyllus Dougl.; Lindl. Bot. Reg. 13: *pl. 1124* [Man. R. M. 53; Bot. Cal. **1**: 119; Wats. Rev. 529].

In open meadows, at an altitude of about 1500 m.

MONTANA: Bozeman, 1887, *Tweedy, 125;* 1886, *1067;* Manhattan, 1895, *Rydberg, 2696.*

* **Lupinus sericeus** Pursh, Fl. Am. Sept. 468 [Bot. Cal. **1**: 119; Wats. Rev. 529].

On prairies, plains and the dryer meadows. Altitude, 1000–2000 m. This species resembles *L. leucophyllus* in general habit, but the spike is longer-peduncled, more lax, shorter, and with fewer and larger flowers.

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* Watson, Revision of Lupinus in Proc. Am. Acad. **8**: 517–548.

MONTANA: Great Falls, 1891, *R. S. Williams, 742;* Lewis and Clarke Co., *Mrs. Muth;* Deer Lodge, 1888, *F. Traphagen;* Bozeman, 1886, *Tweedy, 126* and *1069;* Elk Mts., 1896, *Flodman, 616;* Spanish Basin, July 1, 1897, *Rydberg & Bessey, 4446a;* Indian Creek, July 21, *4446;* Bridger Mts., June 11, *4444.*

YELLOWSTONE PARK: 1884, *Tweedy, 58.*

* **Lupinus Hellerae** Heller, Bull. Torr. Bot. Club, **25**: 265.

In sandy soil, at an altitude of 1000–1500 m. It resembles *L. sericeus* in flowers and leaves, but the stem is much lower, bearing only one or two stem leaves and many basal ones. The habit is therefore more like the western *L. lepidus* Dougl.

MONTANA: Belt Mts., 1888, *R. S. Williams, 741;* Deer Lodge, 1888, *Traphagen* (the latter specimen more loosely hairy than the type).

Lupinus decumbens Torr. Ann. Lyc. N. Y. **2**: 191; *Lupinus argenteus decumbens* Wats. Proc. Am. Acad. **8**: 532 [Man. R. M. 54].

Open prairies and plains, at an altitude of 1000–2500 m.

MONTANA: Mill Creek, 1887, *Tweedy, 128;* Cottonwood Creek, *127.*

YELLOWSTONE PARK: Yellowstone River, 1884, *Tweedy, 61;* Mirror Lake, 1885, *545.*

Lupinus argenteus Pursh, Fl. Am. Sept. 468 [Man. R. M. 53; Ill. Fl. **2**: 269; Bot. Cal. **1**: 121; Wats. Rev. 532].

Open prairies and hills, common, at an altitude of 1000–2000 m. It is doubtful whether the name *L. argenteus* belongs to this species or the preceding. The species so named here is without any question, however, the same as *L. tenellus* Nutt., and the latter has always been regarded as a synonym of *L. argenteus.*

MONTANA: Silver Bow Co., *Mrs. Dolman;* Highwood Mountains, 1888, *R. S. Williams, 100;* Bozeman, 1882, *Tweedy, 178;* Spanish Basin, 1896, *Flodman, 619;* Little Belt Mountains, *620;* Forks of the Madison, July 27, 1897, *Rydberg & Bessey, 4443;* Shields River, 1883, *Scribner, 20a.*

YELLOWSTONE PARK: 1883, *Miss Mary Compton;* 1873, *C. C. Parry, 56.*

Lupinus laxiflorus Dougl.; Lindl. Bot. Reg. **14**: *pl. 1140* [Man. R. M. 53; Bot. Cal. **1**: 121; Wats. Rev. 531].

Meadows, at an altitude of 1500–2500 m.

Montana: Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 4442;* Bridger Mountains, June 14, *4445;* Bozeman, 1883, *Scribner, 206.*

Lupinus parviflorus Nutt.; Hook. & Arn. Bot. Beech. 336 [Man. R. M. 53; Bot. Cal. 1: 120; Wats. Rev. 531].

Meadows, rare, at an altitude of 2000–2500 m.

Montana: Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 4440.*

* Lupinus pseudoparviflorus.

Stems several from a woody caudex, 3–6 dm. high, striate, finely silky-strigose, rather leafy, slender and erect: stipules lanceolate, about 5 mm. long, early deciduous: petioles slender, the lower about twice as long as the leaves; leaflets 8–10, oblanceolate, 3–5 cm. long, acute or mucronate, finely silky-strigose beneath, glabrate above; raceme 1–1.5 dm. long, loosely flowered; bracts almost subulate, a little longer than the pedicels, very early deciduous; pedicels and calyx densely appressed-silky, very gibbous or generally somewhat spurred above; banner very broad, blue, slightly lighter in the center: wings and keel light blue with darker veins, the former a little longer than the banner; corolla about 1 cm. long, perfectly glabrous: ovary hairy; ovules 4–6.

Nearest related to *L. parviflorus*, from which it differs mainly in the narrower leaves and in the pubescence and form of the calyx. In *L. parviflorus* the leaves are mostly obovate and rounded and mucronate at the apex, and the calyx is villous with spreading pubescence, and has no indication of a spur.

In open woods, at an altitude of 2000–2300 m.

Montana: Bridger Mountains, June 17, 1897, *Rydberg & Bessey, 4441* (type); Spanish Basin, 1896, *J. H. Flodman, 615;* 1886, *Tweedy, 1068;* Trail Creek, 1887, *129;* Highwood Mountains, 1888, *R. S. Williams, 744.*

* Lupinus monticola.

Stems numerous from a branched, woody caudex, 1–2 dm. high, grayish strigose or occasionally with more loose pubescence, leafy; stipules linear-lanceolate, 0.5–1 cm. long; lower petioles somewhat exceeding the leaves, the upper often much shorter; leaflets 7–9, narrowly oblanceolate, 2–4 cm. long, acute or acuminate, grayish silky-stigose or somewhat hoary on both sides; raceme 3–6 cm.

long, rather densely flowered; bracts 5–8 mm. long, narrowly linear-lanceolate or often nearly subulate, about twice as long as the pedicels and almost as long as the calyx, silky-villous; calyx silky-villous, only slightly gibbose above, the lower lip entire, the upper one 2-cleft; corolla 8–10 mm. long, glabrous; banner very broad, dark blue with a light brown gibbosity in the middle, exceeded by the dark blue wings, which are united in front; keel lighter colored, except the tip, strongly curved; ovary silky; ovules 4–6.

Among loose rocks, on alpine peaks of southern Montana, at an altitude of 2700–3300 m.

MONTANA: Indian Creek, July 22, 1897, *Rydberg & Bessey, 4447* (type); Old Hollowtop, Pony Mountains, July 7, *4449;* Gallatin Peak, 1886, *Tweedy, 1070;* Belt Mountains, 1886, *F. W. Anderson.*

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 4450;* Mt. Holmes, 1884, *Tweedy, 59* and *60;* Hoodoo Peak, 1897, *P. Koch, 22.*

Lupinus Lyallii Gray, Proc. Am. Acad. **7**: 334 [Man. R. M. 53; Wats. Rev. 534; Bot. Cal. **1**: 122].

This species is recorded from the Bitter Root Mountains by Coulter.

Lupinus aridus Dougl.; Lindl. Bot. Reg. **15**: 1242 [Man. R. M. 52; Wats. Rev. 533; Bot. Cal. **1**: 122].

MONTANA: Sources of Missouri (according to Coulter); Grasshopper Valley, 1880, *Watson.*

Lupinus caespitosus Nutt.; Torr. & Gray, Fl. N. Am. **1**: 379 [Man. R. M. 52; Wats. Rev. 533].

Mountain sides, at an altitude of 2000–3000 m.

YELLOWSTONE PARK: 1883, *Miss Mary Compton;* Mt. Washburn, 1884, *Tweedy, 62;* East DeLacy's Creek, July 10, 1897, *Rydberg & Bessey, 4451;* Yellowstone Falls, 1873, *C. C. Parry, 58.*

Lupinus pusillus Pursh, Fl. Am. Sept. 468 [Man. R. M. 54; Ill. Fl. **2**: 270; Wats. Rev. 538; Bot. Cal. **1**: 125].

Prairies, plains and the lower hills, at an altitude of 1000–2000 m.

MONTANA: Great Falls, 1886, *F. W. Anderson, 80;* 1888, *R. S. Williams, 214;* Stillwater, 1889, *Tweedy, 3;* Gardiner, 1885, *544;* Fridley, 1887, *124;* Custer Co., *Mrs. Light;* Missoula, 1898, *Williams & Griffith.*

Medicago sativa L. Sp. Pl. 778 [Man. R. M. 54; Bot. Cal. **1**: 132; Ill. Fl. **2**: 272].

The Alfalfa is extensively cultivated in Montana, and is occasionally found escaped.

* **Melilotus alba** Desv. in Lam. Encycl. Meth. **4**: 63 [Bot. Cal. **1**: 132; Ill. Fl. **2**: 273].

Escaped from cultivation or introduced.

MONTANA: Helena, 1892, *F. D. Kelsey*.

* **Melilotus officinalis** (L.) Lam. Fl. Fr. **2**: 594 [Bot. Cal. **1**: 132; Ill. Fl. **2**: 274]; *Trifolium Melilotus officinalis* L. Sp. Pl. 765.

Escaped from cultivation or introduced.

MONTANA: Helena, 1891, *F. D. Kelsey*.

Trifolium macrocephalum (Pursh) Poir. in Lam. Encycl. Meth-Suppl. **5**: 336; *Lupinaster macrocephalus* Pursh, Fl. Am. Sept. 479; *Trifolium megacephalum* Nutt. Gen. **2**: 105 [Man. R. M. 54; Bot. Cal. **1**: 127].

MONTANA: Headwaters of Missouri (according to Coulter).

Trifolium pratense L. Sp. Pl. 768 [Man. R. M. 54; Bot. Cal. **1**: 128; Ill. Fl. **2**: 276].

The Red Clover is extensively cultivated in Montana, and occasionally found escaped.

MONTANA: Gallatin Co., *Mrs. Hodgman*.

* **Trifolium Beckwithii** Brewer: Wats. Proc. Am. Acad. **11**: 128 [Bot. Cal. **1**: 128; Ill. Fl. **2**: 277].

The Wild Red Clover is one of the best native forage plants of the state, and where found in quantity produces fine hay. It is a near relative of *T. Kingii*, but is a larger plant, with shorter heads and less reflexed flowers. In meadows, at an altitude of 1500–2500 m.

MONTANA: Beaver Head Co., *Mrs. Alice Barrett;* Big Hole River, 1888, *Tweedy, 5;* Dillon, 1895, *C. L. Shear, 338;* Anaconda, 1892, *Kelsey;* Twin Bridges, *John Wilhart;* Bannock City, 1880, *Watson;* Grasshopper Valley, *Watson*.

* **Trifolium hybridum** L. Sp. Pl. 766 [Ill. Fl. **2**: 278].

The Alsike Clover occasionally escapes from cultivation.

MONTANA: Bozeman, 1895, *Rydberg, 2697*.

Trifolium repens L. Sp. Pl. 767 [Man. R. M. 54: Bot. Cal. **1**: 129; Ill. Fl. **2**: 279].

The White Clover is cultivated in lawns and pastures and occasionally escapes.

MONTANA: Missoula, 1898, *Williams & Griffith.*

* **Trifolium Rydbergii** Greene, Pittonia, **3**: 222.

The Wild White Clover of Montana is also one of the best native forage plants, only surpassed in value by some of the grasses. It is a rather common plant, growing in wet meadows. It is a near relative of *T. longipes*, but it is taller, with larger heads and the flowers reflexed in fruit. In meadows, at an altitude of 2000–3000 m.

MONTANA: Silver Bow Co., *Mrs. Jennie Moore;* Belt Park, 1886, *R. S. Williams, 106;* Beaver Head Co., 1888, *Tweedy, 208;* Spanish Basin, 1896, *Flodman, 621* and *622;* June 26 and July 1, 1897, *Rydberg & Bessey, 4452* and *4453;* Jack Creek, July 15, *4454;* Jocko River, 1883, *Canby, 69;* Belt Mts., 1883, *Scribner, 21.*

YELLOWSTONE PARK: 1884, *Tweedy, 63;* 1888, *Dr. Chas. H. Hall.*

Sometimes it is lower, only about 2 dm. high, with shorter peduncles. Such specimens I have seen from the following localities:

MONTANA: Deer Lodge, 1888, *Traphagen;* Lewis & Clarke Co., *Mrs. Muth;* West Gallatin, 1892, *W. T. Shaw;* Ellison, 1890, *Kelsey.*

YELLOWSTONE PARK: Pelican Creek, 1885, *Tweedy, 553.*

Trifolium andinum Nutt.; Torr. & Gray, Fl. N. Am. **1**: 314 [Man. R. M. 55].

(?) MONTANA: *Nuttall.*

* **Trifolium Haydeni** Porter in Hayden, Rep. **1871**: 480.

Common in the mountain regions, on the higher mountains as well as in the valleys, at an altitude of 2000–2700 m. Dr. Watson included it in *T. Kingii*, with which it has little relationship. It is a cespitose plant, resembling somewhat *T. latifolium* Greene (*T. longipes latifolium*) in leaves and flower, but is perfectly distinct. The leaflets are broadly obovate and sharply denticulate; the flowers white or slightly pinkish on slender, but short, reflexed pedicels. Mountain sides and along brooks, at an altitude of 2000–3000 m.

MONTANA: Mt. Blackmore, 1886, *Tweedy, 1075;* Park Co., 1887; Spanish Basin, 1896, *Flodman, 624;* June 28, 1897, *Rydberg & Bessey, 4458;* Indian Creek, July 22, *4459;* Bridger Mountains, June 15, *4457.*

YELLOWSTONE PARK: Mt. Holmes, 1884, *Tweedy, 65;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 4465.*

Trifolium pauciflorum Nutt.; Torr. & Gray, Fl. N. Am. **1**: 319 [Man. R. M. 56; Bot. Cal. 130].

In moist sandy soil in the western part of the state.

MONTANA: Missoula, 1898, *Williams & Griffith*.

* **Trifolium microcephalum** Pursh, Fl. Am. Sept. 478 [Bot. Cal. **1**: 131].

Belongs to the group represented by the preceding, but the involucre is membranous and less deeply lobed: the head is small and dense and the plant is slender and villous with soft hairs.

MONTANA: Valley of Clark's River, 1806, *Lewis*.

* Trifolium Montanense.

A cespitose or subacaulescent glabrous perennial; flowering stems very short, 1–3-leaved; stipules 5–10 mm. long, ovate or broadly oblong, obtuse, somewhat scarious, brownish-veined; petioles 3–6 cm., or in depauperate specimens only 1–2 cm. long; leaflets 0.5–2 cm. long, obovate, finely but sharply dentate, with the veins running out into the teeth, at the apex rounded and mucronate; peduncle 5–10 cm. long, ascending, bearing an upright head, or in depauperate specimens decumbent and s-shaped, only 2–4 cm. long; head involucrate, 1.5–2 cm. in diameter, 8–20-flowered; lobes of the involucre obovate, often bluntly toothed, obtuse or merely acute, scarious and brown-veined, surpassed by the lower sepals by about one-third; sepals very unequal, the lower three, and especially the central one, much longer than the upper two and the tube of the calyx, all broadly subulate; corolla dark purplish, very glossy, in age brown, veined, and somewhat marcescent; ovules 4.

A very near relative of *T. Parryi*, and has been mistaken for that species. It differs, however, in the smaller size, the broader obovate leaflets, the shorter and blunter divisions of the involucre, the longer lower sepals, and the smaller and darker flowers. In *T. Parryi* the leaflets are oblong or oblanceolate, often acutish, the heads 2.5 cm. in diameter, and the segments of the involucre oblong, generally surpassing the lower sepals which are only slightly longer than the upper ones.

On high mountains, at an altitude of 2500–3200 m.

MONTANA: Old Hollowtop, Pony Mountains, July 7 and 9, 1897, *Rydberg & Bessey*, *4461* (type), *4463* (depauperate form) and *4464*; Mountains, near Indian Creek, July 22, *4462*; Electric Peak, August 18, *4460* (depauperate); Park Co., August, 1887, *F. Tweedy*; Mt. Blackmore, 1886, *1074*; Grizzly Creek, 1887, *114*.

YELLOWSTONE PARK: Mt. Holmes, 1884, *Tweedy*, *64*.

Trifolium nanum Torr. Ann. Lyc. N. Y. **1**: 35 [Man. R. M. 55].

On the summits of the highest peaks, at an altitude of 2700–3300 m.

MONTANA: Indian Creek, July 22, 1897, *Rydberg & Bessey, 4467.*

Trifolium dasyphyllum Torr. & Gray, Fl. N. Am. **1**: 315 [Man. R. M. 55].

On the tops of the highest peaks, rather rare. Altitude 2500–3000 m.

MONTANA: Deep Creek, 1887, *Tweedy, 115;* Old Hollowtop, near Pony, July 7 and 9, 1897, *Rydberg & Bessey, 4455* and *4456.*

Lotus Americanus (Nutt.) Bisch. Linnaea, **14**; Litt. 132 [Ill. Fl. **2**: 280]; *Trigonella Americana* Nutt. Gen. **2**: 120; *Hosackia Purshiana* Benth. Bot. Reg. *pl. 1257* [Man. R. M. 56; Bot. Cal. **1**: 137].

In sandy soil, up to an altitude of 1500 m.

MONTANA: Livingston, 1887, *Tweedy, 112.*

Psoralea lanceolata Pursh, Fl. Am. Sept. 475 [Man. R. M. 57; Bot. Cal. **1**: 140; Ill. Fl. **2**: 281].

MONTANA: Glendive, 1883, *L. F. Ward; Coues.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall.*

Psoralea tenuiflora Pursh, Fl. Am. Sept. 475 [Man. R. M. 56; Ill. Fl. **2**: 281].

Dry plains and hills, up to an altitude of 1500 m.

MONTANA: Great Falls, 1886, *F. W. Anderson, 84;* 1891, *R. S. Williams, 90;* Livingston, 1887, *Tweedy, 122;* Horned Creek, 1883, *Scribner, 25;* Billings, 1898, *Williams & Griffith.*

Psoralea argophylla Pursh, Fl. Am. Sept. 475 [Man. R. M. 57; Ill. Fl. **2**: 283].

Dry prairies and plains, up to an altitude of 1500 m.

MONTANA: Warmsprings, *R. S. Williams, 441;* Custer Co., *Mrs. Light.*

Psoralea esculenta Pursh, Fl. Am. Sept. 475 [Man. R. M. 57; Ill. Fl. **2**: 284].

Plains and hills, up to an altitude of 1500 m.

MONTANA: Great Falls, 1887, *F. W. Anderson;* 1891, *R. S. Williams, 95.*

* **Petalostemon oligophyllum** (Torr.); *Petalostemon gracile oligophyllum* Torr. Emory's Mil. Rec. 139; *Kuhnistera oligophylla* Heller, Bull. Torr. Bot. Club, **23**: 122 [Ill. Fl. **2**: 290].

Prairies and plains, up to an altitude of 1500 m. It differs from *P. candidum* in the more branched stem and the long lax spike.

MONTANA: Lewis and Clarke Co., *Mrs. Muth;* Hilger's, 1892, *F. D. Kelsey;* Custer Co., 1892, *Mrs. Light:* Horned Creek, 1883, *Scribner, 24.*

* **Petalostemon multiflorum** Nutt. Journ. Phil. Acad. **7**: 92: *Kuhnistera multiflora* Heller, Mem. Torr. Bot. Club, **5**: 197 [Ill. Fl. **2**: 290].

Prairies and plains. Altitude, 600–1500 m. Like the last, but with very short almost globose heads.

MONTANA: Great Falls, *F. W. Anderson, 87:* Snowy Mts., 1882, *Canby.*

* Petalostemon molle.

Stems several from a woody caudex, strict, leafy, striate and densely woolly, about 3 dm. high, stout; leaves densely villous, 2–3 cm. long, with two pairs of linear leaflets, 10–15 mm. long, 1.5–2 mm. wide, obtuse, more or less involute, head oblong-cylindric, 2–4 cm. long and 12 mm. in diameter; bracts longer than the flowers, with a lanceolate base and a filiform almost plumose hairy tip: calyx densely silky-villous with yellow or brownish hairs, the lobes lanceolate; corolla rose-color.

It is nearest *Petalostemon purpureum* and may be a form of it. It differs, however, in the broader and obtuse leaflets, the densely villous pubescence of the stem and leaves, the paler flowers and the long and spreading hairs of the tips of the bracts. It grows on dry prairies and hills.

MONTANA: Snowy Mts., 1882, *Canby;* Hound Creek, 1883, *Scribner, 73;* 1896, *Rydberg, 3440; E. N. Brandegee, 81.*

Petalostemon purpureum (Vent.): *Dalea purpurea* Vent. Hort. Cels. *pl. 40; Petalostemon violaceum* Michx. Fl. Bor. Am. **2**: 50 [Man. R. M. 58]; *Kuhnistera purpurea* MacM. Met. Minn. 329 [Ill. Fl. **2**: 290].

Prairies and plains, up to an altitude of 1500 m.

MONTANA: Helena, 1892, *Mrs. Muth;* Lewis and Clarke Co., *Mrs. Muth;* Custer Co., 1892, *Mrs. Light;* Smith River, 1883, *Scribner, 22;* Musselshell River, 1882, *Canby.*

Petalostemon villosum Nutt. Gen. **2**: 85 [Man. R. M. 59]: *Kuhnistera villosa* Kuntze, Rev. Gen. Pl. 192 [Ill. Fl. **2**: 291].

Sand hills.

Glycyrrhiza lepidota Pursh, Fl. Am. Sept. 480 [Man. R. M. 59; Bot. Cal. 1: 143; Ill. Fl. 2: 310].

On river banks and among bushes, up to an altitude of 2000 m.

MONTANA: Gallatin Co., *Mrs. Alderson;* Belt Creek, 1881, *R. S. Williams, 89;* Madison Co., 1889, *Tweedy, 212;* Musselshell River, 1896, *Flodman*; Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 4506;* Smith River, 1883, *Scribner, 33.*

Astragalus crassicarpus Nutt. Fraser's Cat. [Ill. Fl. 2: 297]; *Astragalus caryocarpus* Ker, Bot. Reg. 2: *pl. 176* [Man. R. M. 60].

Prairies, up to an altitude of 1500 m.

MONTANA: Great Falls, 1892, *R. S. Williams;* Ft. Ellis, 1871, *Robert Adams* (Hayden Survey); Bozeman, 1884, *Tweedy, 68.*

* Astragalus prunifer.

Astragalus crassicarpus Rydb. Contr. U. S. Nat. Herb. 3: 491 mainly.

Stems several from a woody caudex, depressed and spreading, 2–4 dm. long, rather thick, sparingly and finely strigose, leafy; stipules ovate, acuminate, 5–10 mm. long, distinct; leaves 10–15 cm. long, somewhat strigose, bright green; leaflets 8–12 pairs, 1–1.5 cm. long, elliptic or sometimes broadly oblong, obtuse, truncate or somewhat emarginate; spike short, on a peduncle 3–10 cm. long; bracts about 5 mm. long, lanceolate, acuminate; pedicels 1–2 mm. long; calyx about 1 cm. long, somewhat gibbous on the upper side, more or less strigose with dark hairs, especially on the teeth; corolla ochroleucous, except the tip of the keel, which is purplish; banner about 2.5 cm. long, narrow and deeply notched at the apex, a fourth longer than the wings; pod perfectly two-celled, fleshy, indehiscent, broadly ellipsoid, usually over 2 cm. long and 1.5–2 cm. in diameter, slightly pointed.

A near relative of *A. crassicarpus* and *A. Mexicanus.* The general habit, the pubescence, and the form of the fruit are those of the former, while the ochroleucous flowers, the width of the leaves, and the size of the pod suggest the latter. It grows on the plains and in open places in the mountain regions, at an altitude of 1200–1800 feet.

MONTANA: Deer Lodge, 1888, *Traphagen;* Trail Creek, 1887, *Tweedy, 140;* Beaver Head Co., 1888, *207;* 1882, *193;* Bridger Mountains, June 12, 1897, *Rydberg & Bessey, 4468;* Bozeman, 1883, *Scribner, 27b;* Birch Creek, *Canby, 70;* "Fort Ellis to Yellowstone," 1871, *R. Adams;* Snowy Mts., 1882, *Canby.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 540.*

Also seen from the following states:

WYOMING: Medicine Bow, 1897, *Aven Nelson, 3143* (type).

SOUTH DAKOTA: Custer, 1892, *Rydberg, 613*, mainly.

SASKATCHEWAN: 1857–8, *E. Bourgeau.*

Astragalus Carolinianus L. Sp. Pl. 757 [Ill. Fl. **2**: 298]; *A. Canadensis* L. l. c. [Man. R. M. 61].

River banks, hillsides, etc., at an altitude of 2000 m.

MONTANA: Spanish Basin, June 23, 1897, *Rydberg & Bessey, 4469;* West Boulder, 1887, *Tweedy, 141;* Snowy Mountains, 1882, *Canby;* Rock Creek, 1883, *Scribner, 26.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 76.*

Astragalus Mortonii Nutt. Journ. Acad. Phil. **7**: 19 [Man. R. M. 61; Bot. Cal. **1**: 155].

Common in meadows throughout the mountain regions, at an altitude of 1000–2000 m. It may be classified among the forage plants of the region.

MONTANA: Beaver Head Co., 1888, *Tweedy, 6;* Melrose, 1895, *Rydberg, 2701;* Great Falls, 1890, *R. S. Williams, 832;* East Gallatin Swamps, 1896, *Flodman, 625;* Jack Creek, July 19, 1897, *Rydberg & Bessey, 4475;* Blackfoot River, 1883, *Canby, 71.*

Astragalus adsurgens Pall. Astrag. 40 [Man. R. M. 61; Ill. Fl. **2**: 299].

Prairies, plains and hills, up to an altitude of 2000 m.

MONTANA: 1889, *F. W. Anderson, 19;* Great Falls, 1886, *91;* 1890, *R. S. Williams, 105;* Livingston, 1886, *Tweedy, 1065;* Bozeman, 1887, *132;* Melrose, 1895, *Shear, 535;* Deer Lodge, 1895, *Rydberg, 2699;* Spanish Basin, June 23, 1897, *Rydberg & Bessey, 4470;* Custer Co., 1892, *Mrs. Light;* Willow Creek, 1883, *Scribner, 27c;* Hell Gate and Black Foot Rivers, 1880, *Watson.*

Astragalus hypoglottis L. Mant. **2**: 274 [Man. R. M. 61; Ill. Fl. **2**: 299].

Meadows, at an altitude of 1200–2200 m.; common. Apparently a valuable forage plant.

MONTANA: Silver Bow Co., *Mrs. Jennie Moore;* Great Falls, 1891, *R. S. Williams, 96;* 1882, *Tweedy, 191;* Gallatin Co., 1887, *135;* Melrose, 1895, *Shear, 539;* Manhattan, 1895, *Rydberg, 2700;* Bridger Mts., June 11, 1897, *Rydberg & Bessey, 4471;*

Pony, July 7 and 8, *4472* and *4473;* Jack Creek, July 15, *4474;* Flathead Region, 1883, *H. B. Ayer, CXXXVIII;* Crow Creek, 1883, *Scribner, 27;* Miles City, 1882, *Canby.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 69.*

Astragalus terminalis Wats. Proc. Am. Acad. **17**: 370 [Man. R. M. 61].

At an altitude of about 2000 m.

MONTANA: Grasshopper Valley, 1888, *Tweedy;* Red Rock Creek, 1880, *Watson, 89.*

* **Astragalus reventoides** Jones, Proc. Cal. Acad. (II.) **5**: 661.

On high mountains, at an altitude of 2500–2700 m. A species with cylindric sessile completely 2-celled pods and yellow flowers in a lax spike; otherwise resembling the preceding.

MONTANA: Beaver Head Co., 1888, *Tweedy, 7;* Lima, 1895, *Rydberg, 2703.*

*Astragalus Kelseyi.

Perennial, with a woody base; stems several, erect, branched, glabrous; leaves with 8–12 pairs of leaflets, which are oblong, about 1 cm. long, obtuse, glabrate above and strigose beneath; raceme rather lax, with a peduncle about 1 dm. long; flowers about 1 cm. long; calyx very short, 5 mm. long, somewhat strigose with dark hairs; sepals triangular; corolla sulphur-yellow; pod short-stipitate, cylindric, slightly sulcate on the dorsal suture, almost perfectly 2-celled, fully 2 cm. long.

Very closely allied to *A. terminalis*, but differs in the longer and narrower pod, which is much less sulcate on the dorsal side and more distinctly stipitate, in the narrower leaflets and the sparser pubescence. It grows on grassy slopes, at an altitude of about 2000 m.

MONTANA; Deer Lodge, 1892, *F. D. Kelsey;* Beaver Head Co., 1888, *Tweedy, 8.*

* **Astragalus scophioides** (Jones); *Astragalus arrectus scophioides* Jones, Proc. Cal. Acad. (II.) **5**: 664.

Resembles somewhat *A. terminalis*, but is a little stouter; it differs principally in the thicker and more coriaceous pod with its long and curved stipe, and lack of groove on the dorsal suture. I cannot see that it is nearly related to *A. arrectus.* Grows at an altitude of 1650 m.

MONTANA: Beaver Head Co., on hills west of Clark's Cañon, 1888, *F. Tweedy, 9.*

Astragalus Drummondii Dougl.: Hook. Fl. Bor. Am. **1**: 153 [Man. R. M. 62; Ill. Fl. **2**: 299].

On prairies and hills, up to an altitude of 2000 m.

MONTANA: Spanish Basin, 1895, *Flodman, 626;* June 24, 1897, *Rydberg & Bessey, 4476;* Bozeman, 1887, *Tweedy, 143;* Beaver Head Co., 1888, *200;* Gallatin Co., *Mrs. Alderson;* Great Falls, 1891, *R. S. Williams, 99;* Shields River, 1883, *Scribner, 27g;* Snowy Mts., 1882, *Canby.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall:* Mammoth Hot Springs, 1884, *F. Tweedy, 70;* 1845, *536.*

Astragalus alpinus L. Sp. Pl. 760 [Man. R. M. 63; Ill. Fl. **2**: 304].

On more or less shady mountain sides, especially among rocks, at an altitude of 2000–3000 m.

MONTANA: Little Belt Pass, 1895, *Flodman, 627;* Bridger Mountains, *642* (?); Park Co., 1889, *Tweedy;* Spanish Basin, June 30 and July 1, 1897, *Rydberg & Bessey, 4478* and *4479;* Silver Bow Co., *Mrs. Jennie Moore;* Beaver Head Co., 1887, *Tweedy, 139;* Belt Bark, 1886, *R. S. Williams, 440;* Bozeman, 1883, *Scribner, 27k.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* 1884, *F. Tweedy, 73;* East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4477;* Hoodoo Peak, 1897, *P. Koch, 16* and *18;* 1883, *Miss Mary Compton.*

Astragalus elegans (Hook.) Sheld. Bull. Geol. & Nat. Hist. Surv. Minn. **9**: 154 [Ill. Fl. **2**: 303]; *Phaca elegans* Hook. Fl. Bor. Am. **1**: 144; *Astragalus oroboides Americanus* Gray, Proc. Am. Acad. **6**: 205 [Man. R. M. 63].

In meadows among bushes, at an altitude of 2000–2500 m.

MONTANA: Sheep Creek, 1896, *Flodman, 633;* Spanish Basin, June 28, 1897, *Rydberg & Bessey, 4480;* Indian Creek, July 21, *4481;* Mill Creek, 1887, *Tweedy, 133.*

YELLOWSTONE PARK: Black Tail Deer Creek, 1884, *Tweedy, 77.*

* **Astragalus elegans curtiflorus**; *Phaca parviflora* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 348; not *A. parviflorus* Lam.

The flowers are smaller, ochroleucous tinged with purple, and the pods are much smaller. On mountain sides.

MONTANA: Yogo, 1888, *R. S. Williams, 657*; Rocky Mts., *Nuttall.*

* Astragalus Macounii.

Astragalus Robbinsii and var. *occidentalis* in part, of western reports.

Stem 5–6 dm. high, not very stout, leafy, slightly striate and finely puberulent; stipules ovate-lanceolate, free; leaves 5–10 cm. long, very thin, odd-pinnate with 4–8 pairs of obtuse oblong or (the lower) oval leaflets 15–25 mm. long; raceme 4–10 cm. long on a peduncle 10–15 cm. long; bracts linear, 2–3 mm. long; pedicels 3–4 mm. long; calyx about 4 mm. long, black-hairy, lobes linear-subulate, about 1 mm. long: corolla about 8 mm. in length, cream-colored, tinged with purple; pod, including the stipe, about 2 cm. long, membranous, black-hairy, acute at both ends, oval in cross-section, neither suture sulcate, but the dorsal with a narrow inflexed edge.

Is nearest related to the eastern *A. Robbinsii*, but is distinguished by the longer more acute pods and the large thin leaves.

BRITISH COLUMBIA: Deer Park, Lower Arrow Lake, 1890, *John Macoun, 25* (type, labeled *Astragalus frigidus* var. *litoralis*); Bow River, 1885, *Macoun.*

MONTANA: Sun River, 1887, *R. S. Williams, 175;* Flathead River, 1883, *Canby, 79.*

* **Astragalus cuspidocarpus** Sheld. Bull. Geol. & Nat. Hist. Surv. Minn. **9**: 147.

Resembles *A. Missouriensis*, but the shorter pods are abruptly contracted into a point and the flowers are salmon yellow or ochroleucous tinged with purple.

MONTANA: 1888, *F. W. Anderson;* Grafton, 1892, *R. S. Williams* (according to Sheldon).

YELLOWSTONE PARK: Mammoth Hot Springs, 1893, *F. H. Burglehaus* (according to Sheldon).

Astragalus Missouriensis Nutt. Gen. **2**: 99 [Man. R. M. 64: Ill. Fl. **2**: 301].

On plains and hills, up to an altitude of 2000 m.

MONTANA: 1882, *Tweedy, 192;* Fridley, 1887, *134;* Gardiner, 1885, *532;* Great Falls, 1891, *R. S. Williams, 7;* Lewis and Clarke Co., *Mrs. Fannie Harwood;* Shields River, 1883, *Scribner, 27l.*

Astragalus lotiflorus Hook. Fl. Bor. Am. **1**: 152 [Man. R. M. 63; Ill. Fl. **2**: 301].

On prairies, up to an altitude of 1500 m.

MONTANA: Great Falls, 1888, *R. S. Williams, 103:* 1886, *F. W. Anderson, 99.*

* **Astragalus lotiflorus elatiocarpus** (Sheldon); *Astragalus lotiflorus brachypus* Gray, Proc. Am. Acad. **6**: 200: not *A. brachypus* Schrenk; *A. elatiocarpus* Sheld. Bull. Geol. & Nat. Hist. Surv. Minn. **9**: 20.

Differs from the species in having most of the flowers borne sessile in the axils of the leaves. It grows in similar locations.

MONTANA: Great Falls, 1889, *F. W. Anderson:* Beaver Head Co., 1888, *Tweedy, 13;* Huntley, 1882, *Canby.*

Astragalus iodanthus Wats. King's Exp. **5**: 70 [Man. R. M. 64].

In sandy soil, at an altitude of about 1000 m.

MONTANA: Upper Sand Coulee, 1888, *R. S. Williams, 745;* Blackfoot River, 1883, *Canby, 75.*

Astragalus Purshii Dougl.; G. Don, Gen. Hist. **2**: 271 [Man. R. M. 65; Bot. Cal. **1**: 151].

On plains and hills, up to an altitude of 2000 m.

MONTANA: Helena, 1888 and 1891, *F. D. Kelsey;* Deer Lodge, 1888, *F. W. Traphagen:* 1882, *Tweedy, 201* and *203;* Gardiner, 1885, *537;* Bridger Mts., June 11, 1897, *Rydberg & Bessey, 4497.*

* **Astragalus inflexus** Dougl.; Don, Gen. Syst. **2**: 256.

Differs from *A. Purshii* in the decidedly caulescent stem, and the larger bright purple flowers.

MONTANA: Helena, 1891, *F. D. Kelsey;* Sand Coulee, 1888, *R. S. Williams, 746;* Mt. Helena, 1887, *F. W. Anderson;* Beaver Head Co., 1888, *Tweedy, 12:* Bozeman, 1882, *202;* Madison River, 1883, *Scribner, 27d;* Flathead Region, 1883, *H. B. Ayres, V.*

* **Astragalus Utahensis** T. & G. Pac. R. R. Rep. **2**: 120 [Bot. Cal. **1**: 151]; *Phaca mollissima Utahensis* Torr. in Stansb. Rep. 385.

Differs from *A. Purshii* in the rounder leaflets, which are covered with a dense white tomentum.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 12.*

Astragalus bisulcatus (Hook.) A. Gray, Pac. R. R. Rep. **12**^{2}: 42 [Man. R. M. 67; Ill. Fl. **2**: 300]; *Phaca bisulcata* Hook. Fl. Bor. Am. **1**: 145.

Prairies, often in saline soil, up to an altitude of 2000 m.

MONTANA: Dillon, 1895, *Shear*, *551;* Deer Lodge, 1895, *Rydberg*, *2704;* Helena, 1888, *F. D. Kelsey;* Beaver Head Co., 1888, *202;* Jack Creek, July 19, 1897, *Rydberg & Bessey*, *4485;* Gallatin Co., *Mrs. Alderson;* Great Falls, 1886, *F. W. Anderson*, *97;* 1891, *R. S. Williams*, *107;* Gallatin City, 1883, *Scribner*, *27u;* Blackfoot River, 1883, *Canby*, *81;* Martindale, 1882, *Canby*.

Astragalus pectinatus (Hook.) Dougl.: Hook. Fl. Bor. Am. **1**: 142 [Man. R. M. 67; Ill. Fl. **2**: 300]; *Phaca pectinata* Hook. Fl. Bor. Am. **1**: 141.

Dry plains, perhaps reaching an altitude of 1500 m.

MONTANA: Great Falls, 1891, *R. S. Williams*, *328;* 1886, *F. W. Anderson*, *98;* South of Snowy Mts., 1882, *Canby*.

Astragalus microlobus Gray, Proc. Am. Acad. **6**: 203 [Man. R. M. 62; Ill. Fl. **2**: 302].

Dry plains, up to an altitude of 1500 m.

MONTANA: Stillwater, 1889, *Tweedy;* Bozeman, 1887, *Tweedy*, *145;* Gallatin City, 1883, *Scribner*, *27b*.

Astragalus flexuosus (Hook.) Dougl.; Hook. Fl. Bor. Am. **1**: 141 [Man. R. M. 67; Ill. Fl. **2**: 302]; *Phaca flexuosa* Hook. Fl. Bor. Am. **1**: 140.

Dry plains, up to an altitude of 2000 m.

MONTANA: Cascade Co., 1889, *F. W. Anderson*; Alhambra, 1888, *F. D. Kelsey;* Stillwater, 1889, *Tweedy;* Park Co., 1889, *Tweedy;* Livingston, 1886, *Tweedy*, *1066;* Lewis & Clarke Co., *Mrs. Muth*.

Phaca Americana (Hook.) Rydb.; Britt. & Brown, Ill. Fl. **2**: 304: *Phaca frigida Americana* Hook. Fl. Bor. Am. **1**: 140; *Astragalus frigidus Americanus* Wats. Bibl. Index **1**: 193 [Man. R. M. 66].

In open woods in wet places, at an altitude of 1500–2500 m.

MONTANA: Spanish Basin, 1896, *Flodman*, *634;* Elk Mts., *635;* Indian Creek, July 21, 1897, *Rydberg & Bessey*, *4483;* Bear Gulch, 1887, *Tweedy*, *136;* Gallatin Co., *Mrs. Alderson;* Clendenin, 1882, *R. S. Williams*, *177;* Fort Ellis to the Yellowstone, 1871, *Adams*.

YELLOWSTONE PARK: Black Tail Deer Creek, 1884, *Tweedy*, *74;* Soda Butte, 1885, *535*.

Phaca microcystis (Gray); *Astragalus microcystis* Gray, Proc. Am. Acad. **6**: 220 [Man. R. M. 66].

In sandy soil, at an altitude of about 2000 m.

MONTANA: Ellison, 1889, *F. D. Kelsey;* Silver Bow Co., 1888, *Tweedy, 11;* Garrison, 1895, *Rydberg;* Little Blackfoot River, 1883, *Canby, 80;* Hell Gate Cañon, 1880, *Watson.*

* **Phaca platytropis** (Gray); *Astragalus platytropis* Gray, Proc. Am. Acad. **6**: 526 [Bot. Cal. **1**: 147].

A tufted silvery-silky nearly stemless species, with scape-like peduncle, yellowish-white flowers, and ovoid sometimes mottled pod.

MONTANA: Glen, Beaver Head Co., 1888, *Tweedy, 201.*

* **Phaca inepta** (Gray); *Astragalus ineptus* Gray, Proc. Am. Acad. **6**: 525.

Although the pod is more or less completely 2-celled and therefore does not agree with the description of *Phaca*, it should undoubtedly be referred to that genus rather than to *Astragalus.* The pod is papery, inflated, and mottled as in most species of *Phaca*, and the habit is exactly that of many of them. The whole section of *Diphysi* show more relationship to the true *Phacae* than to typical *Astragali.* The intrusion of the dorsal suture is scarcely of generic value, as it varies in depth even in the same species.

MONTANA: Lima, Aug. 5, 1895, *Shear, 558; Rydberg, 2698;* Beaver Head Co., 1888, *F. Tweedy, 203.*

Homalobus aboriginorum (Richards); *Astragalus aboriginorum* Richards. Frankl. Journ. App. 746 [Man. R. M. 63: Ill. Fl. **2**: 303]; *Phaca aboriginorum* Hook. Fl. Bor. Am. **1**: 143.

Although the dorsal suture is slightly inflexed, the pod in this species and the next is flat and both sutures are prominent, with no indication of being at all sulcate on the dorsal side. As the habit is like the typical species of *Homalobus*, the two species should rather be referred to that genus. *H. aboriginorum* grows on mountain sides, at an altitude of 1500–3000 m.

MONTANA: Little Belt Pass, 1895, *Flodman, 628;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4482;* Sweetwater Basin, 1888, *Tweedy, 205* (in part); Belt Mts., 1887, *R. S. Williams, 93.*

YELLOWSTONE PARK: Mt. Washburn, 1884, *Tweedy, 71;* Soda Butte Creek, 1885, *533.*

Homalobus glabriusculus (Gray); *Astragalus glabriusculus* Gray, Proc. Am. Acad. **6**: 204 [Man. R. M. 63].

On mountain sides, especially in open woody places, at an altitude of 1500–2500 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy*, *205* (in part).

Homalobus tenellus (Pursh) Britton; Britt. & Brown, Ill. Fl. **2**: 305; *Astragalus tenellus* Pursh, Fl. Am. Sept. 473; *Ervum multiflorum* Pursh, Fl. Am. Sept. 739; *Astragalus multiflorus* Gray, Proc. Am. Acad. **6**: 226 [Man. R. M. 67; Bot. Cal. **1**: 153].

On prairies, up to an altitude of perhaps 2000 m.

MONTANA: Park Co., 1889, *Tweedy*.

* **Homalobus Bourgovii**; *Astragalus Bourgovii* Gray, Proc. Am. Acad. **4**: 227.

Like *Astragalus elegans* in habit, but the dark violet flowers slightly larger and the pod very different, showing its near relationship to *Homalobus campestris* and *decumbens*. Watson includes this in the section with stipitate pod, but William's specimens show the true nature of the fruit. At an altitude of 2000–3000 m.

MONTANA: Yogo, 1888, *R. S. Williams*, *747;* McDonald Peak, 1883, *Canby*, *87;* Bridger Mts., 1896, *Flodman*, *629;* Little Belt Pass, *630* and *632;* Spanish Basin, *631*.

* Homalobus hylophilus.

Stems many, from a branched rather slender rootstock, slender, leafy, with very short joints, finely and sparingly grayish-strigose; stipules ovate, more or less united, about 5 mm. long; leaves nearly erect, 1–1.5 dm. long, sparingly grayish-strigose, pinnate with 6–12, generally 8, pairs of lance-oblong leaflets, 1–2 cm. long, which are acute at both ends; raceme short, 6–12-flowered, on a peduncle about 1 dm. long; bracts small, linear-subulate; pedicels very short; flowers 8–12 mm. long; calyx tube 3 mm long., dark strigose, the teeth very short, scarcely 1 mm. long; corolla almost white, tinged with purple only on the tip of the keel; pod linear-oblong, sessile, tapering at the apex, 2–2.5 cm. long and 3–4 mm. wide, glabrous, more or less reflexed; ovules 9–12.

Has been mistaken for *H. campestris* Nutt. (*Astragalus convallarius* Greene); but differs in the much lower and bushy stems, nearly upright and bright green leaves, short joints of the stem, peduncles which only a little exceed the leaves, broader leaves, and sparser pubescence. It also resembles *H. tenuifolius* Nutt., but is a larger less hairy plant, has much broader leaves and somewhat larger flowers.

It is common in woods, in the mountain regions, at an altitude of 1500–2500 m.

MONTANA: Bridger Mountains, June 17, 1897, *Rydberg & Bessey*, *4490* (type); Jack Creek, July 14, *4491;* Pony Mountains, July 8, *4489;* Spanish Basin, 1896, *J. H. Flodman*, *636*, *638* and *639;* Bridger Pass, *637* and *641;* Little Belt Pass, *640;* Bozeman, 1892, *W. T. Shaw;* Silver Bow Co., *Hattie Hammond;* Trail Creek, 1887, *Tweedy*, *137*.

YELLOWSTONE PARK: 1884, *F. Tweedy*, *80*.

UTAH: Logan, 1895, *Rydberg*, *2705*.

* **Homalobus serotinus** (Gray); *Astragalus serotinus* Gray, Pac. R. R. Rep. **12**: 51.

Scarcely distinct from *H. decumbens*.

MONTANA: North Box Elder Creek, 1886, *R. S. Williams*, *94*.

Homalobus campestris Nutt.; Torr. & Gray, Fl. N. Am. **1**: 351; *Astragalus campestris* Gray, Proc. Am. Acad. **4**: 229 [Man. R. M. 68].

The type specimen, in the Herbarium of Columbia University, is decumbent, slender, grayish-strigose, and has narrow leaves. It is very hard to distinguish this from *H. serotinus*, but it has shorter racemes and larger flowers with more upturned banner.

MONTANA: Park Co., 1887, *F. Tweedy;* Beaver Head Co., 1888, *Tweedy*, *204;* Mission Range, 1883, *Canby*, *85;* Boulder Creek, 1883, *Scribner*, *27p*.

* **Homalobus tenuifolius** Nutt.; Torr. & Gray, Fl. N. Am. **1**: 352.

This has been included in *H. campestris*, but is a very low and bushy plant, less than 1 dm. high, with short narrowly linear leaflets. At an altitude of 2000–3000 m.

MONTANA: Lima, 1895, *Rydberg*, *2706;* Helena, *2708;* Bridger Mts., June 14 and 15, 1897, *Rydberg & Bessey*, *4494* and *4495;* June 11, *4493;* Old Hollowtop, Pony, July 7, *4492*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* 1884, *Tweedy*, *81*.

Homalobus junceus Nutt.; Torr. & Gray, Fl. N. Am. **1**: 351; *Astragalus junceus* A. Gray, Proc. Am. Acad. **4**: 230 [Man. R. M. 68].

Dry plains, up to an altitude of 2000 m.

MONTANA: Helena, 1891, *F. D. Kelsey;* Mt. Helena, 1883, *Canby*, 84; *Scribner*, *279*.

* **Homalobus Palliseri** (Gray); *Astragalus Palliseri* Gray, Proc. Am. Acad. **4**: 227.

Somewhat resembling *H. campestris*, but with a stipitate pod.
MONTANA: Ridge above Terminus, 1880, *Watson*, *88*.

* **Homalobus stenophyllus** (Torr. & Gray); *Astragalus stenophyllus* Torr. & Gray, Fl. N. Am. **1**: 329.
MONTANA: Headwaters of Missouri, *Wyeth*.

Homalobus vexiliflexus (Sheld.); *Astralagus pauciflorus* Hook. Fl. Bor. Am. **1**: 149 [Man. R. M. 68]; not Pall.; *Astragalus vexiliflexus* Sheldon, Bull. Geol. & Nat. Hist. Surv. Minn. **9**: 27.

Mountain sides, on plains in loose soil, at an altitude of 1500–2000 m.

MONTANA: Cottonwood Creek, 1896, *Flodman*, *643*; Bridger Mts., June 14, 1897, *Rydberg & Bessey*, *4486*; Bozeman, 1887, *Tweedy*, *158*; 1892, *Mrs. Alderson*; *John Pearsall*, *815*; Deep Creek, 1891, *R. S. Williams*, *102*; Flathead River, 1883, *Canby*, *82*; Bozeman, *82*; Fort Ellis to the Yellowstone, 1891, *R. Adams*; Madison, 1883, *Scribner*, *270*; Shield's River, *27*.

* **Homalobus aculeatus** (A. Nelson); *Astragalus aculeatus* A. Nelson, Bull. Torr. Bot. Club, **26**: 10.

Related to *H. tegitarius* (*Astragalus tegitarius* Wats.) and *H. montanus* (Nutt.) Britt. (*A. Kentrophyta* Gray), but differs from both in its dark purple flowers. From *H. implexus* (*A. tegitarius implexus* Canby) it differs in the greater size and scantier pubescence. On high mountains, at an altitude of 2500–3500 m.

MONTANA: Cedar Mts., June 16, 1897, *Rydberg & Bessey*, *4487*; Beaver Head Co., 1888, *Tweedy*, *10*; Lake Plateau, 1897, *P. Koch*, *60*.

YELLOWSTONE PARK: 1884, *F. Tweedy*, *83*; Mammoth Hot Springs, 1885, *542*; Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey*, *4488*; Hoodoo Peak, 1897, *P. Koch*, *13*; Grand Cañon, 1872, *Coulter*.

Homalobus caespitosus Nutt.; Torr. & Gray, Fl. N. Am. **1**: 352 [Ill. Fl. **2**: 306]; *Astragalus caespitosus* Gray, Proc. Am. Acad. **6**: 230.

On dry hills, at an altitude of 1000–2000 m.

MONTANA: White Beaver Creek and Park Co., 1889, *F. Tweedy*; Grafton, 1888, *R. S. Williams*, *15*; Snowy Mts., 1882, *Canby*.

Orophaca caespitosa (Nutt.) Britton; Britt. & Brown, Ill. Fl. **2**: 306; *Phaca caespitosa* Nutt. Gen. **2**: 98; *Astragalus triphyllus* Pursh, Fl. Am. Sept. 740 [Man. R. M. 69]; not Pall.

Dry plains and hills, at an altitude of 1000–2000 m.

MONTANA: Gallatin Co., 1888, *F. Tweedy, 206;* Fort Benton, *John Pearsall, 838* (Lt. Mullan's Exped.); 1882, *Tweedy, 205;* Fridley, 1887, *144;* Gardiner, 1885, *538;* Gallatin Co., *Mrs. Alderson;* Grafton, 1892, *R. S. Williams, 97;* Shields River, 1883, *Scribner, 27a;* Billings, 1898, *Williams & Griffith.*

Aragallus sericeus (Nutt.) Greene, Pittonia, **3**: 212; *Oxytropis sericea* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 339; *O. Lambertii sericea* Gray, Proc. Am. Acad. **20**: 7 [Man. R. M. 70]; *Spiesia Lambertii sericea* Rydberg, Bot. Surv. Neb. **3**: 32 [Ill. Fl. **2**: 309].

On plains and prairies, at an altitude of about 1500 m.

MONTANA: Custer Co., 1892, *Mrs. Light.*

*Aragallus Besseyi.

Oxytropis argentata Pursh, Fl. Am. Sept. 473; not Persoon.

Perennial, more or less tufted: basal leaves numerous, grayish silky-strigose or somewhat villous; leaflets 5–12 pairs, oblong-lanceolate, 10–18 mm. long and 3–5 mm. wide, acute; scape erect, strict, 1–2 dm. high; spike short and dense, almost subcapitate; bracts green, lanceolate, about 1 cm. long, silky-ciliate; calyx villous with long silky hairs, its linear subulate lobes equalling the claws of the petals; corolla dark bluish purple: standard rather narrow, oblong, deeply two-lobed at the summit: wings large, a little exceeding the standard in length, two lobed at the end, the upper lobe broadly ovate, the lower rounded; keel rather small, shorter than and wholly inclosed by the wings; fruit ovate-oblong, acuminate into a long beak, coriaceous, half two-celled, silky-villous and exceeding the calyx.

In general habit, pubescence, and the form of the leaflets, it very much resembles *A. Lambertii*, from which it is easily distinguished by the form of the standard and the wings. It grows on dry hillsides, at an altitude of 1800 m. The species is named in honor of Mr. Ernst A. Bessey, the second son of Professor Charles E. Bessey, of the University of Nebraska. Mr. Bessey, who is a very promising young botanist, was my assistant during the botanical exploration in 1897.

MONTANA: Spanish Basin, June 23, 1897, *Rydberg & Bessey, 4501* (type); Melrose, 1895, *Rydberg;* Bozeman, 1886, *Tweedy, 1023;* Smith River, 1883, *Scribner, 29.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall.*

* **Aragallus spicatus** (Hook.); *Oxytropis campestris spicata* Hook. Fl. Bor. Am. **1**: 147 [Torr. & Gray, Fl. N. Am. **1**: 341]; *Oxytropis Lambertii ochroleuca* A. Nelson, First Rep. Fl. Wyo. 98; *Aragallus albiflorus* Nelson, Erythea, **7**: 62.

Differs from *A. Lambertii* in the broader leaflets, the long spike and yellow flower. Nelson's co-type specimens match so closely those of Hooker's variety, preserved in the Torrey Herbarium, that it is impossible to keep *A. spicatus* and *A. albiflorus* apart. Prof. Nelson cites two of the following specimens. On hills and plains, up to an altitude of 2500 m.

MONTANA: Ft. Benton, *John Pearsall, 925* (Lt. Mullan's Exped.); Little Belt Mts., 1896, *Flodman, 644;* Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey, 4505;* Cedar Mountain, July 16, *4504;* Gallatin Co., *Mrs. Alderson:* Great Falls, 1886, *R. S. Williams, 98.*

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 548.*

Aragallus monticola (Gray) Greene, Pittonia, **3**: 212; *Oxytropis monticola* Gray, Proc. Am. Acad. **20**: 6 [Man. R. M. 71].

On hills and mountains, at an altitude of 1500–2000 m.

MONTANA: Little Belt Mts., 1896, *Flodman, 647;* Cottonwood Creek, *646* (?); 1882, *Tweedy, 196;* Jocko River, 1883, *Canby, 91;* Upper Marias Pass, 1883, *Canby, 92:* Kishiner River, 1861, *Lyall.*

* **Aragallus gracilis** A. Nelson, Erythea, **7**: 60.

This species is common in the Black Hills of South Dakota and Eastern Wyoming, and is also found in Manitoba and Assiniboia. Prof. Nelson refers the following specimen to it. I have seen none from Montana. *A. gracilis* is nearest related to *A. monticola* but is taller, looser-flowered, and has semi-membranous pods, which are more appressed to the rachis and more distinctly 2-celled. In size the plant is intermediate between *A. spicatus* and *A. monticola*, but rather more slender than either.

MONTANA: Mystic Lake, 1898, *Blankinship.*

* **Aragallus dispar** A. Nelson, Erythea, **7**: 61.

A species characterized by the short calyx-lobes and the diverse leaves, the leaflets of the lower ones being almost orbicular and those of the upper oblong to linear.

MONTANA: Custer, 1890, *Blankinship* (according to Nelson).

* Aragallus alpicola.

Depressed-cespitose, scarcely more than 3–4 cm. high, the short thick stems densely covered with the remnants of old leaves; stipules membranous, broadly ovate, acute, covered with white silky hairs; leaves all basal, numerous, short, 2–3 cm. long, divergent, white-silky, with 4–6 pairs of oblong, obtuse or acutish leaflets, which are 5–8 mm. long; scape depressed or ascending, often doubly curved, 3–4 cm. high: spike very short, subcapitate, 3–8-flowered; bracts lanceolate or linear, about half as long as the calyx; the latter cylindric, about 8 mm. long, more or less densely black-hairy, as well as the upper part of the scape, the teeth short, broadly lanceolate, subequal; corolla about 15 mm. long, sulphur-yellow, the keel tipped with purple; wings broad and broadly emarginate; pod about 15 mm. long and 6 mm. in diameter, divergent, subcoriaceous, ovoid and tipped with a short beak.

It was at first mistaken for a depauperate form of *A. monticola*, but Tweedy's specimens with well developed fruit have persuaded me that it deserves rather specific rank. In *A. monticola* the fruit is of a much thinner texture, with a longer divergent straight beak; in *A. alpicola* it is divergent, subcoriaceous and very short-beaked. In that respect it is nearer *A. Lambertii* and *A. spicatus* from which it is easily distinguished by its small size. In *A. monticola* the leaves are mostly erect or ascending, about 1 dm. long and with 10–15 pairs of leaflets, the scape is erect, over 1 dm. high, and the spike is elongated and many-flowered.

A. alpicola grows on the very tops of the highest peaks, together with *Douglasia montana*, at an altitude of over 3000 m.

MONTANA: Old Hollowtop, near Pony, July 9, 1897, *Rydberg & Bessey, 4503.*

YELLOWSTONE PARK: Mt. Holmes, 1884, *Tweedy, 66;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey.*

Aragallus viscidus (Nutt.) Greene, Pittonia, 3: 211; *Oxytropis viscida* Nutt.; Torr. & Gray, Fl. N. Am. 1: 341 [Man. R. M. 71].

On hills, at an altitude of 1000–2000 m.

MONTANA: Lima, *Rydberg, 2717;* Great Falls, 1887, *R. S. Williams, 619.*

OREGON: *Nuttall* (type).

WYOMING: Garfield Peak and Gros Ventre, 1894, *Aven Nelson, 669* and *928;* Black Rock Creek, 1897, *Tweedy, 265.*

NEVADA: East Humbolt Mountains, *Watson, 292.*

* Aragallus viscidulus.

Perennial, with a more or less tufted caudex covered with the remnants of old leaves and stipules; leaves all basal, 5–10 cm. long, with 8–15 pairs of leaflets, loosely villous-pubescent; stipules broadly ovate, long-acuminate, membranous, sparingly covered with white silky hairs; leaflets oblong, 5–10 mm. long, obtuse or acutish; scape 1–1.5 dm. high, terete, erect or ascending, sparingly silky-villous, the upper portion with black hairs and somewhat viscid; spike rather dense, oblong; bracts green, linear-oblong or lanceolate, the lower often equalling or exceeding the calyx, which is cylindric, densely hairy and viscid, and more or less blackish; sepals lanceolate; petals yellowish at the base, the upper portion dark bluish-purple; pod membranous, oblong-ovate, gradually tapering into a short beak, 1–1.5 cm. long, finely black-pubescent, or in age glabrate; ventral suture strongly inflexed, half dividing the pod.

It has generally gone under the name of *Oxytropis viscida*, and is apparently more common than that species. When I first saw Nuttall's type specimen in the Torrey Herbarium in 1894, I became convinced that there must be something wrong, for Nuttall's specimen of *O. viscida* looked to me more like *O. monticola* Gray, than the plant generally known under the former name. It was not, however, until I had seen the excellent specimens of the true *A. viscida*, collected by Prof. Aven Nelson, of the University of Wyoming, that I was able to determine the differences. *Aragallus viscidus* is a stouter plant, characterized by the long and rather coarse yellow hairs covering the base of the stem and the stipules, the longer lighter-colored, never black, hairs of the upper part of the stem, the calyx and the pod, and by the form of the latter; this is ovoid, and more abruptly contracted into a longer beak which is fully half as long as the body.

Aragallus viscidulus grows on dry hills or mountain sides, at an altitude of 2000–3000 m.

Montana: Melrose, 1895, *Rydberg, 2716.*

Yellowstone Park: 1873, *C. C. Parry, 89;* Specimen Ridge, 1885, *Tweedy, 549.*

Utah: American Fork Cañon, 1880, *M. E. Jones, 1898.*

British America: Morley, 1885, *John Macoun.*

* Aragallus viscidulus depressus.

Depressed-cespitose; scapes short and spreading; spikes few-flowered, less black; leaves only 2–3 mm. long.

It is very unlike the species in general habit, but there are no differences in the flowers or fruit. It was found at an altitude of 3300 m.

MONTANA: Haystack Peak, Park Co., 1887, *Tweedy*, *120*.

Aragallus lagopus (Nutt.) Greene, Pittonia, **3**: 212; *Oxytropis lagopus* Nutt. Journ. Acad. Phila. **7**: 17 [Man. R. M. 70].

Dry hills, at an altitude of 1500–2000 m.

MONTANA: Head of Missouri, *Wyeth*: Big Blackfoot River, *John Pearsall*, *892* (Lt. J. Mullan's Exped.); Dear Lodge, 1888, *F. W. Traphagen*; Lima, 1895, *Rydberg*, *2713*; Bridger Mountains, June 11, 1897, *Rydberg & Bessey*, *4499* and *4502*: Helena, 1887, *F. W. Anderson*: Bozeman, 1893, *W. T. Shaw*; *Mrs. Alderson*: Great Falls, 1885, *R. S. Williams*, *353*: Bozeman Pass, 1883, *Canby*, *90*.

Aragallus nanus (Nutt.) Greene, Pittonia, **3**: 212; *Oxytropis nana* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 340 [Man. R. M. 70].

On dry hills and plains, at an altitude of 1500–2500 m.

MONTANA: Madison Co., 1888, *F. Tweedy*, *709*; Lima, 1895, *Rydberg*, *2714*: Melrose, *2715*: Spanish Peaks, 1896, *Flodman*, *648*: Deer Lodge, 1892, *F. D. Kelsey*: Red Rock Creek, 1880, *Watson*, *94*.

YELLOWSTONE PARK: 1873, *C. C. Parry*, *91*.

* **Aragallus collinus** A. Nelson, Erythea, **7**: 57.

The following specimens I take to belong to this species, but they differ from Professor Nelson's description in the color of the flowers and in the size of the leaflets. The color of the flowers is, so far as I know, always purplish blue, fading in age to whitish or yellow, and the leaflets are seldom over 1 cm. long.

Related to *A. Besseyi*, *A. lagopus* and *A. nanus*. From the first it is distinguished by the fewer and somewhat smaller flowers, the broader calyx-lobes and bracts, the shorter wings, which are less deeply lobed, the broader standard and the structure of the pod. From *A. nanus* it differs in the longer erect strict scape, the spike, which in fruit is often more elongated, and in the more numerous leaflets. It, perhaps, most resembles *A. lagopus*, from which it is readily distinguished by the appressed pubescence of the scape. It is not uncommon on dry hillsides, at an altitude of 1800–2700 m.

MONTANA: Spanish Basin, June 26, 1897, *Rydberg & Bessey*, *4500*; June 23, *4498*; 1896, *Flodman*, *649*: Mill Creek, 1887, *Tweedy*, *121*; Melrose, 1888, *Tweedy*, *110a*; Gardiner, 1885, *531*.

Yellowstone Park: 1888, *Dr. Chas. H. Hall.*
Wyoming: Laramie, 1894, *Nelson, 285.*

* Aragallus argophyllus.

Densely cespitose; stipules large and membranous, hairy; leaves silvery-white, 3–4 cm. long; leaflets 3–5 pairs, linear-lanceolate, generally less than 1 cm. long, mostly convolute; scape less than 5 cm. long, depressed and curved upward, white-strigose; spike capitate; bracts linear-lanceolate, half as long as the calyx; the latter white silky-hirsute, cylindric; the tube twice as long as the linear-lanceolate sepals and half as long as the corolla; standard and wings rather narrow; fruit unknown.

This species has been confounded with *A. nanus*, from which it differs in the silvery-white pubescence and the long cylindric calyx. The form of the calyx in flower does not at all suggest that it will become inflated in fruit.

Montana: Little Blackfeet River, 1860, *Cooper's Journey* (Herb. Torrey).

* **Aragallus Blankinshipii** A. Nelson, Erythea, **7**: 58.

The description of this species agrees very closely with *A. Besseyi*, except that the bracts are said to be small, linear-lanceolate and shorter than the calyx-tube and the pod wholly included in the calyx, narrowly elliptic, one-celled, and slightly inflated but with the walls firm. It is, therefore, nearer related to *A. collinus*. I have seen no specimens.

Montana: Middle Creek, 1898, *J. W. Blankinship* (according to Nelson).

Aragallus splendens (Dougl.) Greene, Pittonia, **3**: 212; *Oxytropis splendens* Dougl.; Hook. Fl. Bor. Am. **1**: 147 [Man. R. M. 70]; *Spiesia splendens* Kuntze, Rev. Gen. Pl. 207 [Ill. Fl. **2**: 309].

In valleys and open woods, at an altitude of 2000–3000 m.

Montana: Little Rocky Mts., 1889, *Dr. V. Havard;* Little Belt Mts., 1896, *Flodman, 645;* Silver Bow Co., *Mrs. Jennie Moore;* Belt River, 1881, *R. S. Williams, 104;* Smith River, 1883, *Scribner, 28;* Copperopolis, 1882, *Canby.*

Aragallus deflexus (DC.) Heller, Cat. N. A. Pl. 4; *Oxytropis deflexa* DC. Astrag. 96 [Man. R. M. 69].

In woods, at an altitude of 2000–3000 m.

Montana: Dillon, 1895, *Rydberg, 2710;* Bozeman, *2711;*

Indian Creek, July 22, 1897, *Rydberg & Bessey, 4496:* Fridley, 1887, *Tweedy, 118;* Mill Creek, 1887, *119;* Silver City, 1891, *Kelsey;* Smith River, 1883, *Scribner, 30;* Birch Lakes, 1883, *Canby, 89.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 79.*

* **Aragallus foliolosus** (Hook.); *Oxytropis foliolosa* Hook. Fl. Bor. Am. **1**: 146.

This has been regarded as a depauperate alpine form of *A. deflexus.* It differs, however, not only being stemless, but in the capitate spike, the bracts little more than half the length of the calyx, the pubescence finer and more appressed, and the shorter pod only about 1 cm. long, black-hairy, and scarcely deflexed in fruit. It is very nearly related to *A. Lapponicus* (*Oxytropis Lapponica*) of Europe.

Within the region it grows at an altitude of over 3000 m.

YELLOWSTONE PARK: Mt. Holmes, 1884, *Tweedy, 78.*

* **Onobrychis Onobrychis** (L.); *Hedysarum Onobrychis* L. Sp. Pl. 751, 1753; *Onobrychis sativa* Lam. Fl. Fr. **2**: 652, 1778.

The Espasute, a plant with bright red flowers and lomentaceous pod, is cultivated in many places, especially in the Deer Lodge Valley, and sometimes escapes.

MONTANA: Deer Lodge, 1895, *Rydberg, 2709.*

Hedysarum Americanum Britt. Mem. Torr. Bot. Club, **5**: 201 [Ill. Fl. **2**: 301]; *Hedysarum alpinum Americanum* Michx. Fl. Bor. Am. **2**: 74; *H. boreale* Nutt. Gen. **2**: 110 [Man. R. M. 72].

In mountain woods in the northern part of the state.

MONTANA: Lewis & Clarke Co., *Mrs. Muth:* Jocko Range, 1880, *Watson.*

* Hedysarum lancifolium.

Stout, over half a meter high; stem striate, sparingly strigose, in age glabrate; lower stipules large, broadly lanceolate, brown, 1–2 cm. long, the upper small, linear-lanceolate; leaves about 15 cm. long, with 6–10 pairs of leaflets, these lanceolate, acute, mucronate, about 3 cm. long and 8 mm. wide, slightly strigose or glabrate; racemes about 2 dm. long, lax; bracts linear-subulate, about 5 mm. long; calyx-tube 3 mm. long, oblique, lower lobes about 2.5 mm. long, lanceolate-subulate; corolla about 15 mm. long, purplish rose; loments with 2–4 joints, these broadly oval, 12–15 mm. long and about 8 mm. wide, decidedly wing-margined, somewhat strigose.

In the size and color of the flowers it resembles *H. Mackenzii*, but it has the short calyx-teeth of *H. Americanum*, although they are more slender. The general habit is that of the latter but the leaflets are longer and more decidedly lanceolate. The joints of the fruit are almost twice as long as in *H. Americanum* and with an evident wing-margin. In mountain woods.

MONTANA: Headwater of Jocko River, 1883, *Canby*, *93*.

Hedysarum sulphurescens Rydb. Bull. Torr. Bot. Club, **24**: 253; *Hedysarum flavescens* Coulter & Fisher, Bot. Gaz. **18**: 300; not Regel & Schm.

Like *H. Americanum*, but with sulphur-yellow flowers. On mountain sides, at an altitude of 2000–3000 m.

MONTANA: Little Rocky Mts., 1889, *Dr. V. Havard;* Beaver Head Co., 1888, *F. Tweedy*, *213;* Bozeman, 1895, *Rydberg*, *2720;* Spanish Basin, 1896, *Flodman*, *650;* Bridger Mts., *651;* Jack Creek Cañon, July 15, 1897, *Rydberg & Bessey*, *4508;* Electric Peak, Aug. 18, *4507;* Bear Creek, 1887, *Tweedy*, *117;* Tiger Butte, 1887, *R. S. Williams*, *92;* Upper Marias Pass, 1883, *Canby*, *93;* Cut Bank Creek, *93;* Sixteen Mile Creek, 1883, *Scribner*, *31*.

YELLOWSTONE PARK; Mt. Holmes, 1884, *Tweedy*, *72:* Slough Creek, 1885, *550*.

Hedysarum Mackenzii Richards. Frankl. Journ. 745 [Man. R. M. 72; Ill. Fl. **2**: 311].

On mountain sides, at an altitude of 2000–2500 m.

MONTANA: Jack Creek, July 19, 1897, *Rydberg & Bessey*, *4509;* Beaver Head Co., 1888, *Tweedy*, *214:* Billings, 1882, *Canby;* Sixteen Mile Creek, 1883, *Scribner*, *32*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy*, *75;* Soda Butte Creek, 1885, *Tweedy*, *551*.

* **Hedysarum cinerascens**; *Hedysarum canescens* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 357, 1838; not L. 1753.

Like the last, but minutely canescent and generally with narrower leaves. At an altitude of 1000–2500 m.

MONTANA: Lima, 1895, *Rydberg*, *2721;* Park Co., 1889, *Tweedy;* Trail Creek, 1887, *116;* Belt Cañon, 1887, *R. S. Williams*, *91*.

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy*, *551*.

Vicia truncata Nutt.; Torr. & Gray, Fl. N. Am. **1**: 270: *Vicia Americana truncata* Brewer & Wats. Bot. Cal. **1**: 158 [Man. R. M. 72; Ill. Fl. **2**: 329: Bot. Cal. **1**: 158].

Along streams, at an altitude of 1000–2500 m.

MONTANA: Bridger Mountains, June 11 and 14, 1897, *Rydberg & Bessey, 4510* and *4511*: Park Co., 1889, *Tweedy*: Helena, 1891, *F. D. Kelsey*; 1891, *S. A. Merritt*: Gallatin Co., *Mrs. Alderson*; Custer Co., 1892, *Mrs. Light*.

Vicia Americana Muhl.; Willd. Sp. Pl. **3**: 1096 [Ill. Fl. **2**: 326; Bot. Cal. **1**: 157; Man. R. M. 72].

On prairies, reaching an altitude of 2500 m.: rare.

MONTANA: Missoula, 1898, *Williams & Griffith*.

YELLOWSTONE PARK: 1883, *Miss Mary Compton*.

Vicia linearis (Nutt.) Greene, Fl. Fran. 3 [Ill. Fl. **2**: 326]; *Lathyrus linearis* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 276; *Vicia Americana linearis* S. Watson, Proc. Am. Acad. **11**: 134 [Man. R. M. 72; Bot. Cal. **1**: 158].

On prairies, up to an altitude of 2500 m.

MONTANA: Deer Lodge, 1895, *Shear, 362*; *Rydberg, 2118*: *F. W. Traphagen*; Helena, 1895, *Rydberg, 2722*: Bozeman, 1885, *Tweedy, 552*; 1882, *194*; Great Falls, 1885, *R. S. Williams, 672*: Bozeman, 1892, *W. T. Shaw*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall*.

* **Lathyrus ochroleucus** Hook. Fl. Bor. Am. **1**: 159 [Ill. Fl. **2**: 332].

Characterized by its cream-colored large flowers, large and broad leaflets, and large stipules. Up to an altitude of 2000 m.

MONTANA: Highwood Cañon, 1888, *R. S. Williams, 748*: Missoula Co., *Mrs. Kennedy*: Flathead River, 1883, *H. B. Ayres, LXIX*.

* **Lathyrus Shaffneri**; *Lathyrus parvifolius* Wats. Proc. Am. Acad. **17**: 345, 1882: not Roth. 1797.

Near *L. venosus*, but with narrower leaves.

MONTANA: Missoula Co.; *Mrs. Kennedy*; Lewis & Clarke Co., *Mrs. Murphy* (leaves very narrow).

MALVACEAE.

Sphaeralcea rivularis (Hook.) Torr.; Gray, Mem. Am. Acad. (II.) **4**: 23 [Man. R. M. 42]; *Sphaeralcea acerifolia* Nutt; Torr. &

Gray, Fl. N. Am. **1**: 228 [Syn. Fl. 1^1: 317]; *Malva rivularis* Dougl.; Hook. Fl. Bor. Am. **1**: 107.

In woods and cañons, at an altitude of 1500–2500 m.

MONTANA: Bozeman, 1895, *Rydberg, 2725;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 4524;* Columbia Falls, 1892, *R. S. Williams, 871;* Gallatin Cañon, 1886, *Tweedy;* Gallatin Co., *Mrs. Hodgeman;* Bear Creek Cañon, 1892, *W. T. Shaw;* Missoula, 1898, *Williams & Griffith;* Ross' Hole, 1880, *Watson.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 436.*

Malvastrum coccineum (Pursh) Gray, Mem. Am. Acad. (II.) **4**: 21 [Ill. Fl. **2**: 421: Man. R. M. 41; Syn. Fl. 1^1: 313]: *Christaria coccinea* Pursh, Fl. Am. Sept. 454.

Dry prairies, up to an altitude of 2000 m.

MONTANA: Helena, 1888 and 1891, *F. D. Kelsey;* Great Falls, 1891, *R. S. Williams, 119;* Cinnabar, 1884, *Tweedy, 309;* Gardiner, 1885, *435;* Bozeman, 1887, *230:* Madison Co., *Mrs. McNulty;* Custer Co., 1892, *Mrs. Light.*

HYPERICACEAE.

Hypericum formosum H.B.K. Nov. Gen. & Sp. **5**: 196 [Syn. Fl. 1^1: 289]; *Hypericum Scouleri* Hook. Fl. Bor Am. **1**: 111 [Bot. Cal. 1: 81; Man. R. M. 40].

Meadows, at an altitude of 1000–2500 m.

MONTANA: Meadow Creek, July 12, 1897, *Rydberg & Bessey, 4525;* East Boulder, 1887, *Tweedy, 231;* Great Fall, 1886, *F. W. Anderson, 63;* Priest's Pass, 1891, *F. D. Kelsey;* Deer Lodge Co., *Miss Emma Ware;* Helena, 1894, *E. Douglass;* Cottonwood Creek, 1892, *W. T. Shaw;* Beaver Creek, 1894, *E. Douglass;* Ross' Hole, 1880, *Watson.*

* **Hypericum anagalloides** Cham. & Sch. Linnaea, **3**: 127 [Bot. Cal. 1 : 81; Syn. Fl. 1^1: 289].

A small plant, often forming mats, with small leaves 4–12 mm. long, 15–20 stamens and 1-celled capsules. Wet grounds, at low altitudes.

MONTANA: Lo-Lo Creek, 1880, *Watson.*

ELATINACEAE.

Elatine triandra Schk. Handb. **1**: 345 [Man. R. M. 40; Syn. Fl. 1^1: 281; Ill. Fl. **2**: 438].

In shallow pools, up to an altitude of 2500 m.

MONTANA: Sphynx, 1887, *Tweedy, 173.*

YELLOWSTONE PARK: Yellowstone Lake, 1885, *Tweedy, 408.*

Elatine Americana Arn. Edinb. Journ. Nat. & Geogr. Sci. **1**: 430 [Man. R. M. 40; Syn. Fl. **1**¹: 281; Ill. Fl. **2**: 437; Bot. Cal. **1**: 80].

In shallow pools.

MONTANA: Lower Sand Coulee, 1891, *R. S. Williams, 854.*

* Elatine rubella.

Whole plant reddish, low and depressed; stems scarcely more than 5 mm. long; leaves broadly obovate-spatulate, fleshy, about 2 mm. long: flowers 3-merous; pod depressed globose, 3-celled 1.5 mm. in diameter; seeds similar to those of *E. Americana.*

It may be a form of *E. Americana*, but the plant is much smaller, the leaves very fleshy, and the flowers 3-merous. In volcanic sand, at the edge of a pool.

YELLOWSTONE PARK: near Yellowstone Lake, 1885, *Tweedy, 439.*

* Elatine Williamsii.

Stem 3–5 cm. long, rather slender: leaves broadly spatulate, distinctly petioled, 5–8 mm. long, including the petiole, thin, indistinctly 3-nerved: flowers 4-merous, on pedicels 1–2 mm. long; seeds curved into a hook, less than 0.5 mm. long, with numerous transverse lines.

Nearest related to *E. Californica*, but more slender, with thinner leaves and much smaller seeds. In *E. Californica* they are almost 1 mm. long. The habit is more like that of *E. triandra.*

MONTANA: Lower Sand Coulee, 1891, *R. S. Williams, 855;* Missoula, 1898, *Williams & Griffith.*

VIOLACEAE.

Viola cognata Greene, Pittonia, **3**: 145; *Viola cucullata* Coulter, Man. R. M. 29; not Ait.: *V. palmata cucullata* Gray, Syn. Fl. 1¹: 196, in part.

A near relative of *V. cucullata* of the eastern United States, but without doubt distinct, as shown by Prof. Greene. It grows in rich soil, especially on river banks, up to an altitude of 2000 m.

MONTANA: Gallatin Co., *Mrs. Alderson;* Bozeman, 1892, *W. T. Shaw;* Helena, 1891, *F. D. Kelsey.*

Viola palustris L. Sp. Pl. 934 [Man. R. M. 29; Syn. Fl. 1^1: 197; Ill. Fl. **2**: 450; Bot. Cal. **1**: 55].

In bogs, up to an altitude of 2500 m.

MONTANA: Grizzly Creek, 1887, *Tweedy, 252.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1889, *F. W. Dewart.*

* **Viola blanda** Wild. Hort. Berol. *pl. 24* [Syn. Fl. 1^1: 198; Ill. Fl. **2**: 450; Bot. Cal. **1**: 55].

Resembles somewhat *V. palustris*, but with small white flowers, very short saccate spur, and small round-reniform glabrous leaves. It is a rather rare plant of eastern and northern distribution.

MONTANA: Granite, 1892, *F. D. Kelsey.*

* **Viola alsophila** Greene, Pittonia, **4**: 7; *Viola amoena* LeConte, Ann. Lyc. N. Y. **2**: 144; not Forst.; *Viola blanda amoena* B.S.P. Prel. Cat. N. Y. 6 [Syn. Fl. 1^1: 198; Ill. Fl. **2**: 450].

Resembles *V. palustris* in the size and form of the leaves, which, however, are more or less hairy. The flower resembles that of *V. blanda*, but is larger. It grows in mossy ground, up to an altitude of 2000 m.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 4536;* Buffalo Creek, 1885, *Tweedy, 457.*

* **Viola orbiculata** Geyer; Hook. Lond. Journ. Bot. **6**: 73; *Viola sarmentosa orbiculata* Gray, Syn. Fl. 1^1: 199.

A low species with round-reniform leaves, light yellow flowers and short stolons bearing mostly cleistogamous flowers. It belongs to the Pacific slope, but is found occasionally in the western part of the state.

MONTANA: Silver Bow Co., *Mrs. Moore;* Pyrenees, 1889, *Mrs. Moore.*

Viola Nuttallii Pursh, Fl. Am. Sept. 174 [Man. R. M. 30; Syn. Fl. 1^1: 199; Ill. Fl. **2**: 452; Bot. Cal. **1**: 57].

On the plains and prairies, and ascending the valleys up to an altitude of 2000 m.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Bozeman, 1882 and 1885, *Tweedy, 458;* Helena, 1890, *F. D. Kelsey;* Gallatin Co., *Mrs. Alderson;* Great Falls, 1888, *R. S. Williams, 116,* in part.

* **Viola vallicola** A. Nelson, Bull. Torr. Bot. Club, **26**: 128.

Resembles somewhat *V. Nuttallii*, but the leaves are shorter and more glabrate, the flowers somewhat larger and brighter yellow, and the pods globular and pubescent. It is a mountain plant, growing at an altitude of 2000–3000 m.

MONTANA: Bridger Mts., June 10–12, 1897, *Rydberg & Bessey, 4541* and *4547;* Bozeman, 1892, *W. T. Shaw:* Madison Co., *Mrs. McNulty;* Bozeman Pass, 1883, *Scribner, 9b.*

* **Viola flavovirens** Pollard, Bull. Torr. Bot. Club, **24**: 405.

A larger plant than either of the two preceding, with large light green leaves, large light yellow flowers and longer and softer pubescence. In rich soil, under rocks on the mountain sides, at an altitude of 2500–3000 m.

MONTANA: Bridger Mts., June 12 and 18, 1897, *Rydberg & Bessey, 4548* and *4549:* Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey, 4540;* Grizzly Creek, 1887, *Tweedy, 249;* Belt Mts., 1888, *R. S. Williams, 116*, in part.

YELLOWSTONE PARK: Mammoth Hot Springs, 1889, *F. W. Dewart.*

Viola venosa (Wats.); *Viola Nuttallii venosa* Wats. King's Exp. **5**: 35, 1871; *V. aurea venosa* Brew. & Wats. Bot. Cal. **1**: 56 [Man. R. M. 29; Bot. Cal. **1**: 56]: *V. praemorsa venosa* Gray, Syn. Fl. **1**^{1}: 200: *V. purpurea* Kellogg, Proc. Cal. Acad. Sc. **1**: 55, 1873.

On high mountains, at an altitude of 2500–3000 m.

MONTANA: Park Co., Grizzly Creek, 1887, *Tweedy, 250.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1889, *F. W. Dewart.*

Viola Canadensis L. Sp. Pl. 936 [Man. R. M. 29; Syn. Fl. **1**^{1}: 202; Ill. Fl. **2**: 453].

Common in woods, up to an altitude of 2500 m.

MONTANA: Bozeman, 1895, *Rydberg, 2726:* 1896, *Flodman, 657;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 4533;* Bridger Mts., June 14, *4534* and *4535;* Gallatin Co., 1897, *Tweedy, 253;* Bozeman, 1882, *Tweedy;* Helena, *F. D. Kelsey;* Bozeman, 1892, *F. W. Shaw; Mrs. Alderson;* Jefferson City, 1883, *Scribner, 9c;* Hell Gate, 1880, *Watson.*

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 455.*

* **Viola glabella** Nutt.; Torr. & Gray, Fl. N. Am. **1**: 142 [Bot. Cal. **1**: 57; Syn. Fl. 1^1: 201].

Resembling somewhat *V. Canadensis* in habit, it is easily distinguished by its yellow flowers.

MONTANA: Upper Marias Pass, 1883, *Canby, 34.*

Viola adunca Smith in Rees. Cycl. 37: *Viola canina adunca* Gray, Proc. Am. Acad. **8**: 377 [Man. R. M. 29; Bot. Cal. **1**: 55].

In valleys, up to an altitude of 2500 m.

MONTANA: Park Co., 1887, *F. Tweedy, 251;* Deer Lodge, 1888, *F. W. Traphagen;* Granite, 1892, *F. D. Kelsey;* Madison Co., *Mrs. McNulty;* Silver Bow Co., *Mrs. Moore;* Butte, 1896, *J. F. Kemp;* Head of Stillwater, 1897, *P. Koch, 67.*

YELLOWSTONE PARK: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey, 4528;* 1883, *Miss Mary Compton.*

Viola adunca longipes (Nutt.): *Viola longipes* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 140; *V. canina longipes* Wats. Bot. Cal. **1**: 56 [Man. R. M. 29].

MONTANA: Deer Lodge, 1888, *F. W. Traphagen.*

* Viola Montanensis.

Rootstalk slender, but rather woody; stems several, slender, 1–2 dm. high, pubescent with short more or less reflexed hairs; stipules 1–2 cm. long, narrowly lanceolate, tapering at both ends, entire or slightly toothed with narrow teeth, but not dissected: petioles slender, 3–5 cm. long; leaf-blade 3–5 cm. long, broadly ovate, often subcordate at the base, obtuse at the apex, finely crenate and pubescent with short hairs; peduncles slender, 3–10 cm. long, with one or generally two narrowly linear bracts scarcely 1 cm. long below the flower; sepals narrow, linear-lanceolate; petals blue, with yellowish-white base and spur, obovate, 8–10 mm. long, the lateral a little bearded; spur about 5 mm. long, obtuse, straight or slightly curved; stigma slightly beaked; pod ellipsoid, about 1 cm. long; seeds pear-shaped, 2 mm. long, light isabel-blue.

Resembles *V. arenaria* somewhat in the form of the leaves and in the pubescence, but is a much larger plant, resembling *V. striata* somewhat in habit. It differs from both in its narrow subentire stipules, and from the latter also in the pubescence. The latter character also separates it from *V. adunca* Smith.

In wet places in open woods, at an altitude of 1500–2000 m.

MONTANA: Jack Creek Cañon, July 15, 1897, *Rydberg & Bessey, 4532;* Bridger Mts., June 12, *4531.*

* Viola monticola.

Stems numerous, from a woody rootstock, very short, less than 5 cm. high, densely pubescent with short hairs; stipules 0.5–1 cm. long, lanceolate, entire or sometimes bristle-toothed; leaves on very short petioles, densely puberulent: blade broadly ovate, truncate or cordate at the base, about 2 cm. long, obtuse, finely crenate; peduncles short, about 2 cm. long: sepals broadly lanceolate; petals blue with yellowish-white base, narrow, obovate, 5–8 mm. long, the lateral ones bearded; spur about 5 mm. long, curved upwards; pod ovoid, 5–8 mm. long; seeds like those of the preceding species.

Resembles in many respects the foregoing species, but is a much smaller plant, with very short stems, small leaves and broad sepals. Resembles much more *V. arenaria*, from which it differs in the subentire stipules, the color and the form of the spur. On dry hills in southern Montana, at an altitude of 1800–2500 m.

MONTANA: Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4529:* Electric Peak, August 20, *4527;* Bozeman, 1885, *Tweedy, 456;* 1892, *W. T. Shaw:* Priest's Pass, 1892, *Kelsey.*

YELLOWSTONE PARK: Near the Lone Star Geyser, August 7, *Rydberg & Bessey, 4526:* Mammoth Hot Springs, 1889, *F. W. Dewart:* 1884, *Tweedy, 103.*

* Viola odontophora.

Stems several from a rather slender perennial root, 5–8 dm. high, sparingly and minutely puberulent, more or less striate; stipules 5–8 mm. long, toothed with slender linear-subulate teeth: leaves round-cordate, obtuse, slightly crenate, finely puberulent or in age glabrate; blade 10–15 mm. long; petiole 2–3 cm. long, slightly margined: peduncles 4–5 dm. long, with one or two small linear bracts a little above the middle; sepals linear-lanceolate, about 6 mm. long; petals purple or the lower portion yellowish white, more or less distinctly purple-veined, over 1 cm. long; spur short, about 5 mm. long, strongly saccate at the end, where it is 3 mm. in diameter, and strongly tubercular-toothed on the upper side.

Intermediate between the two preceding in size and habit, but differs in the form of the spur.

MONTANA: Grafton, 1892, *R. S. Williams, 114.*

GERANIACEAE.

Geranium viscosissimum F. & M. Ind. Sem. Hort. Petrop. **11**: Suppl. 18; *Geranium incisum* Nutt.: Torr. & Gray, Fl. N. Am. **1**: 206 [Man. R. M. 44; Syn. Fl. **1**^{1}: 358: Bot. Cal. **1**: 94]; not Andrews.

Common in the valleys, up to an altitude of 2500 m.

MONTANA: Little Belt Mts., 1896, *Flodman, 652;* Jack Creek, July 14, 1897, *Rydberg & Bessey, 4514;* Park Co., 1889, *Tweedy;* Helena, 1891, *Kelsey;* Bozeman, 1887, *Tweedy, 225;* Salesville, 1892, *W. T. Shaw;* Madison Co., *Mrs. Flora McNulty;* Gallatin Co., *Mrs. Hodgman.*

YELLOWSTONE PARK: 1888. *Dr. Chas. H. Hall;* 1884, *Tweedy;* 1883, *Miss Mary Compton.*

Geranium Richardsonii Fish. & Trautv. Ind. Sem. Hort. Petrop. **4**: 37 [Man. R. M. 44; Syn. Fl. **1**¹: 359; Bot. Cal. **1**: 94].

Common in woods, up to an altitude of 2500 m.

MONTANA: *John Pearsall, 823;* Little Rocky Mts., 1889, *Dr. V. Havard;* Little Belt Mts., 1896, *Flodman, 653* and *654;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 4516;* Forks of the Madison, July 26, *4512;* Highwood Creek, 1888, *R. S. Williams, 221;* Bozeman, 1887, *Tweedy, 226;* Lewis and Clarke Co., *Mrs. Muth;* Beaver Head Co., 1880, *Watson.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 232;* 1888, *Dr. Chas. H. Hall.*

* **Geranium Bicknellii** Britton, Bull. Torr. Bot. Club, **24**: 92 [Ill. Fl. **2**: 343].

Resembles the following species, but has longer pedicels, narrow sepals and a long beak to the fruit. It grows on hillsides, up to an altitude of 2000 m.

MONTANA: Jack Creek, July 15, 1897, *Rydberg & Bessey, 4515;* Melrose, 1895, *Rydberg, 2723;* Basin, 1892, *Kelsey.*

Geranium Carolinianum L. Sp. Pl. 682 [Man. R. M. 44; Syn. Fl. **1**¹: 360; Ill. Fl. **2**: 342; Bot. Cal. **1**: 94].

Hillsides and waste places, but rarer than the preceding.

MONTANA: Silver Bow Co., *Mrs. Helen Dolman.*

LINACEAE.

Linum Lewisii Pursh, Fl. Am. Sept. 210 [Syn. Fl. **1**¹: 345; Ill. Fl. **2**: 349]; *Linum perenne* Torr. & Gray, Fl. N. Am. **1**: 204 [Man. R. M. 42; Bot. Cal. **1**: 89]; not L.

Common in valleys and on hillsides, at an altitude of 1000–2000 m.

MONTANA: Elk Mountains, 1896, *Flodman, 655;* Spanish Basin, June 23, 1897, *Rydberg & Bessey, 4518;* Bridger Mts., June 11, *4517;* Park Co., 1889, *Tweedy;* Warm Springs, 1892, *Kelsey;* Great Falls, 1891, *R. S. Williams, 144:* Gallatin Co., *Mrs. Alderson;* Deer Lodge Co., *Misses Hobson* and *Ware;* 1892, *W. T. Shaw*.

YELLOWSTONE PARK: 1883, *Miss Mary Compton;* 1885, *Tweedy, 792*.

Linum rigidum Pursh, Fl. Am. Sept. 210 [Man. R. M. 42; Syn. Fl. **1**^{1}: 347: Ill. Fl. **2**: 351].

On dry plains and hills, scarcely reaching an altitude of 2000 m.

MONTANA: Manhattan, 1895, *Rydberg, 2724;* Fort Custer, 1891, *Tweedy;* Great Falls, 1891, *R. S. Williams, 145:* Lewis and Clarke Co., *Mrs. Muth;* Custer Co., 1892, *Mrs. Light*.

POLYGALACEAE.

Polygala alba Nutt. Gen. **2**: 87 [Man. R. M. 30: Syn. Fl. **1**^{1}: 455; Ill. Fl. **2**: 360].

On prairies and plains, up to an altitude of 2000 m.

MONTANA: Big Timber, 1887, *Tweedy, 227:* Custer Co., 1892, *Mrs. Light*.

EUPHORBIACEAE.

* Euphorbia albicaulis.

Depressed, divaricately many-branched: stems and branches slender, very light greenish yellow, glabrous and shining: leaves very short-petioled, light green, linear, 1-nerved, entire or minutely callous-toothed towards the apex, 1–1.5 cm. long and 2–3 mm. wide; involucre very small, about 1 mm. in diameter, turbinate; appendages minute, rather broad, truncate and crenulate, white; pod acutely angled, smooth, 2 mm. long: seeds light brown, oblong, acutely 4-angled, 1.3–1.5 mm. long, less than 0.5 mm. broad, slightly cross-wrinkled.

Nearest related to *E. serpyllifolia*, from which it differs in the much narrower leaves, broader appendages, and the seeds which are brown, and always lack the white bloom usual in *E. serpyllifolia*. The narrow leaves, the slender branches and light color of the plant reminds one of *E. petaloidea*, but the appendages are minute and the seeds much smaller, narrower and sharply 4-angled. It grows in sandy soil and in cultivated ground, at an altitude of about 1500 m.

NEBRASKA: Cheyenne Co., 1891, *Rydberg, 356* (type).

MONTANA: Beaver Head Co., 1888, *Tweedy, 124*.

Euphorbia serpyllifolia Pers. Syn. **2**: 14 [Ill. Fl. **2**: 372: Man. R. M. 326].

In sandy soil, up to an altitude of 1500 m.

Montana: Sun River, 1883, *Scribner, 249;* Missoula, 1898, *Williams & Griffith.*

Yellowstone Park: Upper Geyser Basin, 1885, *Tweedy, 443.*

Euphorbia glyptosperma Engelm. Bot. Mex. Bound. Surv. 187 [Ill. Fl. **2**: 373; Man. R. M. 326].

In sandy soil, up to an altitude of about 2500 m.

Montana: Custer Co., 1892, *Mrs. Light;* Helena, 1892, *Kelsey.*

Yellowstone Park: Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 3943;* Upper Basin, Aug. 6, *3944.*

Euphorbia marginata Pursh, Fl. Am. Sept. 607 [Ill. Fl. **2**: 376; Man. R. M. 327].

On prairies and in pastures, up to an altitude of 1000 m.

Montana: Custer Co., 1897, *Mrs. Light;* N. E. Montana, 1892, *Dr. Holloway;* Miles City, 1886, *Peter Koch, 1100.*

Euphorbia dictyosperma F. & M. Ind. Sem. Hort. Petrop. **2**: 37 [Ill. Fl. **2**: 379; Man. R. M. 327].

On prairies, up to an altitude of 2000 m.

Montana: Helena, 1888 and 1890, *F. D. Kelsey;* Hell Gate Cañon, 1880, *Watson.*

Euphorbia robusta (Engelm.) Small, in Britton & Brown, Ill. Fl. **2**: 381: *Euphorbia montana β robusta* Engelm. Bot. Mex. Bound. Surv. 192; *Euphorbia montana* Coulter, Man. R. M. 327, in part.

Dry hills, up to an altitude of 2000 m.

Montana: Livingston, 1889, *Tweedy;* Shields River, 1883, *Scribner, 250;* Sand Coulee, 1892, *R. S. Williams, 357;* Missoula, 1882, *Tweedy, 376.*

CALLITRICHACEAE.

Callitriche palustris L. Sp. Pl. 969 [Ill. Fl. **2**: 382]; *Callitriche verna* L. Fl. Suec. Ed. 2: 4 [Man. R. M. 328].

In ponds and slow streams, up to an altitude of 2500 m.

Montana: Jack Creek, July 16, 1897, *Rydberg & Bessey, 4519;* Sand Coulee, 1891, *R. S. Williams, 621.*

Yellowstone Park: Lower Falls, 1871, *T. C. Porter.*

Callitriche bifida (L.) Morong, Mem. Torr. Bot. Club, **5**: 215 [Ill. Fl. **2**: 382]; *Callitriche palustris bifida* L. Sp. Pl. 969; *C. autumnalis* L. Fl. Suec. Ed. 2: 4 [Man. R. M. 328].

In ponds and slow streams, up to an altitude of 1500 m.

MONTANA: Great Falls, 1891, *R. S. Williams, 772.*

LIMNANTHACEAE.

* Floerkia occidentalis.

Very slender, less than 1 dm. high, perfectly glabrous, and somewhat fleshy; leaves 1–2 cm. long, pinnate with 1–2 pairs of leaflets, these oblong or oblanceolate and 5–8 mm. long; pedicels 1 cm. long or more, longer than the petioles and often equalling the whole leaf in length; sepals ovate, acute, 2–3 mm. long; petals oblanceolate, about half as long as the sepals; carpels two, sharply rugose-tuberculate.

Resembles the eastern *F. proserpinacoides*, but is a smaller plant, has much shorter leaves with shorter leaflets, comparatively longer pedicels, broader sepals, and sharper-tubercled fruit. In *F. proserpinacoides* the pedicels are little if any longer than the petioles and always much shorter than the leaves. In wet places, at an altitude of 2000–2500 m.

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 525.*

UTAH: Wasatch Mountains, 1869, *S. Watson, 208.*

WASHINGTON: *Wilkes Expedition.*

ANACARDIACEAE.

Rhus trilobata Nutt.; Torr. & Gray, Fl. N. Am. **1**: 219 [Ill. Fl. **2**: 387]; *Rhus aromatica trilobata* Gray, Am. Journ. Sci. (II.) **33**: 408 [Man. R. M. 50; Bot. Cal. **1**: 110]; *Rhus Canadensis trilobata* Gray; Coult. Cont. U. S. Nat. Herb. **2**: 68 [Syn. Fl. **1**^{1}: 386].

Exposed hill sides, up to an altitude of 2500 m.

MONTANA: Jack Creek, July 14, 1897, *Rydberg & Bessey, 4520;* Miles City, 1882, *Tweedy, 374;* Great Falls, 1892, *R. S. Williams, 277;* Lewis & Clarke Co., *Mrs. Muth;* Billings, 1898, *Williams & Griffith.*

* Rhus Rydbergii Small.

A single-stemmed shrub, less than a meter high, with grayish, somewhat striate bark; leaves pinnately 3-foliolate with petioles 6–12 dm. long; leaflets 3–10 cm. long, broadly ovate, often somewhat rhomboid, rather thick, bright green, strongly veined beneath, glabrous except the veins on the lower surface, with wavy or sinuately toothed margins; flowers in small conical axillary panicles, which are much shorter than the petioles, their branches short; flowers yellow; petals about 3 mm. long, ovate, whitish yellow with greenish streaks; fruit when ripe white and shining, a little depressed-globular, 5–6 mm. in diameter.

It has been invariably mistaken for *R. Toxicodendron*, which has pubescent sinuately lobed leaflets, and is confined to the southeastern United States. From *R. radicans (R. Toxicodendron* var. *radicans)*, it differs in never being a climber, but always an erect shrub, in the thicker, somewhat glaucous leaves, the smaller and denser panicles, and the larger flowers and fruit. Both grow together in Nebraska, and they always remain distinct. The present species occurs on hillsides and in open woods, from Kansas to Arizona and British Columbia.

MONTANA: Great Falls, 1885, *R. S. Williams, 291;* northern Montana, *F. W. Anderson.*

CELASTRACEAE.

Pachystima Myrsinites (Pursh) Raf. Am. Monthly Mag. **2**: 176 [Man. R. M. 46; Bot. Cal. **1**: 99; Syn. Fl. **1**^{1}: 398]; *Ilex ? Myrsinites* Pursh, Fl. Am. Sept. 119.

In woods, up to an altitude of 2500 m.

MONTANA: Virginia City, 1886, *Tweedy, 1089;* Columbia Falls, 1892, *R. S. Williams, 872;* Missoula, 1880, *Watson.*

ACERACEAE.

Acer glabrum Torr. Ann. Lyc. N. Y. **2**: 172 [Man. R. M. 49; Syn. Fl. **1**^{1}: 436; Ill. Fl. **2**: 399; Bot. Cal. **1**: 107].

In damp woods and along streams, ascending to an altitude of 2500 m.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Bridger Mountains, June 12, 1897, *Rydberg & Bessey, 4521;* Bear Gulch, 1887, *F. Tweedy, 171;* Belt Mts., 1891, *R. S. Williams, 616;* Deer Lodge Co., *Miss Emma Ware;* Bridger Cañon, 1892, *W. T. Shaw;* Missoula, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 281.*

Acer glabrum tripartitum (Nutt.) Pax in Engler's Jahrb. **7**: 218; *Acer tripartitum* Nutt.: Torr. & Gray, Fl. N. Am. **1**: 247.

A form with trifoliolate leaves.

MONTANA: Mullen Pass, 1860, *Pearsall.*

Acer grandidentatum Nutt.: Torr. & Gray, Fl. N. Am. **1**: 247 [Man. R. M. 49; Syn. Fl. **1**^{1}: 440].

MONTANA: *Nuttall.*

Acer Negundo L. Sp. Pl. 1056 [Syn. Fl. **1**^{1}: 440; Ill. Fl. **2**: 400]; *Negundo aceroides* Moench, Meth. 334 [Man. R. M. 49].

The Box Elder grows throughout the plains and prairie regions, mostly along the water courses, and reaches perhaps an altitude of 1500 m.

MONTANA: Stillwater, 1889, *Tweedy;* Helena, 1891, *F. D. Kelsey.*

RHAMNACEAE.

Ceanothus sanguineus Pursh, Fl. Am. Sept. 167 [Man. R. M. 47: Syn. Fl. **1**^{1}: 409].

Only found on the west side of the main range of the Rockies.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 873.*

Ceanothus velutinus Dougl.: Hook. Fl. Bor. Am. **1**: 125 [Man. R. M. 47; Syn. Fl. **1**^{1}: 410; Bot. Cal. **1**: 102].

Rather common on hill sides, at an altitude of 1000–2500 m.

MONTANA: Little Rocky Mts., 1889, *Dr. V. Havard:* Bridger Mountains, 1896, *Flodman, 656;* June 18, 1897, *Rydberg & Bessey, 4523;* Electric Peak, Aug. 18, *4522;* Great Falls, 1886, *F. W. Anderson, 71:* Belt Mts., 1891, *R. S. Williams, 358;* Deer Lodge Co., *Miss Emma Ware.*

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy, 427.*

Rhamnus alnifolia L'Her. Sert. Ang. 5 [Man. R. M. 46; Syn. Fl. **1**^{1}: 407; Bot. Cal. **1**: 100; Ill. Fl. **2**: 406].

In swampy woods, up to an altitude of 2500 m.

MONTANA: North Fork of Sun River, 1887, *R. S. Williams;* Jocko Lake, 1880, *Watson;* Lo-Lo Creek, *Watson.*

YELLOWSTONE PARK: East Fork of Yellowstone, 1885, *Tweedy, 428.*

LOASACEAE.

Mentzelia integrifolia (Wats.); *Mentzelia albicaulis integrifolia* Wats. King's Exp. **5**: 114. 1871: *Mentzelia dispersa* Wats. Proc. Am. Acad. **11**: 115. 1876 [Man. R. M. 107: Bot. Cal. **1**: 236].

Hillsides, up to an altitude of 2500 m.

MONTANA: Spanish Basin, June 24, 1897, *Rydberg & Bessey*, *4544;* Bozeman, 1887, *Tweedy*, *151:* 1884; Columbia Falls, *Mrs. J. J. Kennedy*, *32;* Prickly Pear Cañon, 1887, *R. S. Williams*, *687;* Mystic Lake, 1883, *Canby*, *139;* Shinberger's Cañon, 1880, *Watson;* Ross' Hole, 1880, *Watson*.

YELLOWSTONE PARK: Cache Creek, 1885, *Tweedy*, *453*.

* Mentzelia tenerrima.

Stem very slender, only 1–2 mm. in diameter, ascending, branched, straw-color, pilose, in age glabrous, 4–5 dm. high; root annual; leaves linear-lanceolate, 2–3 cm. long, pilose, entire: flowers very small, subtended by one or two linear bracts: sepals linear-lanceolate, 1 mm. long; petals narrow, 2–3 mm. long, lemon-yellow; capsule linear, 15 mm. long and 2–3 mm. in diameter: seeds 1 mm. long, sharply angled and finely pitted under a strong lens.

Belongs to the *M. integrifolia* group, but is much more slender than any described species. It was found on a dry hillside, together with *Chenopodium atrovirens*, at the base of a few trees of the Douglas Spruce, at an altitude of 2500 m.

MONTANA: Foot of Electric Peak, August 18, 1897, *Rydberg & Bessey*, *4542*.

* Mentzelia Tweedyi.

Root annual: stem very slender as in the last species, erect, about 3 dm. high, 1–2 mm. in diameter, somewhat pilose when young, straw-colored: leaves linear in outline, 2–5 cm. long, pinnately lobed with distant oblong lobes, or the upper ones almost entire; flowers very small, subtended by small linear bracts; petals 5, oblanceolate, light yellow, 3–4 mm. long: sepals subulate, 1 mm. long; capsule linear-clavate, 15 mm. long and 2–3 mm. in diameter; seeds round-angled, muricate.

Resembles closely the preceding, differing only in the seeds and the leaves. It stands in the same relation to *M. albicaulis* as the preceding does to *M. integrifolia*. It was found under pine trees, at an altitude of 1800 m.

MONTANA: Trail Creek, Park Co., 1887, *Tweedy*, *152*.

Mentzelia albicaulis (Hook.) Dougl.: Hook. Fl. Bor. Am. **1**: 222, as synonym [Man. R. M. 107: Ill. Fl. **2**: 459; Bot. Cal. **1**: 235]; *Bartonia albicaulis* Hook. Fl. l. c.

Hillsides, up to an altitude of 2500 m.

MONTANA: Beaver Head Co., 1887, *Tweedy, 134:* Jefferson River, 1883, *Scribner, 60a.*

Mentzelia decapetala (Pursh) Urb. & Gilg. in Engler & Prantl, Nat. Pfl. Fam. **3**: Abt. 6a, 111 [Ill. Fl. **2**: 459]; *Bartonia decapetala* Pursh: Sims. Bot. Mag. *pl. 1487: Mentzelia ornata* Torr. & Gray, Fl. N. Am. **1**: 534 [Man. R. M. 107].

In cañons and sand-draws, throughout the plain regions, up to an altitude of about 2000 m.

MONTANA: Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 4545;* East Montana, 1884, *Tweedy;* Ruby River, 1887, *150;* Silver Bow Co., 1888, *135;* Great Falls, 1885, *F. W. Anderson, 161;* Deer Lodge Co., *Miss Emma Ware;* Cinnabar, 1886, *P. Koch, 1101:* Great Falls, 1891, *R. S. Williams, 54:* Head of Missouri, 1882, *Canby;* Rock Creek, 1883, *Scribner, 60.*

Mentzelia laevicaulis (Dougl.) Torr. & Gray, Fl. N. Am. **1**: 535 [Man. R. M. 107; Ill. Fl. **2**: 459: Bot. Cal. **1**: 237]; *Bartonia laevicaulis* Dougl.: Hook. Fl. Bor. Am. **1**: 221.

In cañons and on hillsides, up to an altitude of 2500 m.

MONTANA: Garrison, 1895, *Rydberg, 2737:* Emigrant Gulch, 1897, *Rydberg & Bessey, 4546;* Gallatin Co., *Mrs. Alderson;* Livingstone, 1887, *Tweedy, 148:* Ruby River, *149:* Silver Bow Co., 1888, *Tweedy, 136;* Box Elder Creek, 1887, *R. S. Williams, 727;* Helena, 1887, *686;* Elk Creek, 1883, *Scribner, 59:* Billings, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: Hot Sulphur Springs, 1871, *Hayden.*

CACTACEAE.

Cactus Missouriensis (Sweet) Kuntze, Rev. Gen. Pl. 259 [Coult. Contr. U. S. Nat. Herb. **3**: 110; Ill. Fl. **2**: 462]; *Mamillaria Missouriensis* Sweet, Hort. Brit. 171 [Man. R. M. 109].

Dry prairies and plains, up to an altitude of over 2000 m.

YELLOWSTONE PARK: *Tweedy, 423* (according to Coulter).

* **Cactus Notesteinii** (Britton); *Mamillaria Notesteinii* Britton, Bull. Torr. Bot. Club, **18**: 367.

Nearest allied to the preceding; differing in the ash-gray (not greenish) and often pink-tinged flowers and the ciliate spines. It is a rare species.

MONTANA: Deer Lodge, 1891, *F. N. Notestein;* Great Falls, 1886, *R. S. Williams, 670.*

Cactus viviparus Nutt. in Fraser's Cat. [Coult. Contr. U. S. Nat. Herb. **3**: 119; Ill. Fl. **2**: 462]; *Mamillaria vivipara* Haw. Syn. Pl. Suec. Suppl. 72 [Man. R. M. 109].

Dry prairies and plains, up to an altitude of 1500 m.

MONTANA: *John Pearsall, 801* (?); Great Falls, 1886, *R. S. Williams, 401; Hayden, 1854* and *1855; Vernon Bailey, 1890* (the latter two according to Coulter).

Opuntia polyacantha Haw. Syn. Pl. Succ. Suppl. 82 [Coult. Contr. U. S. Nat. Herb. **3**: 435; Ill. Fl. **2**: 464]; *Opuntia Missouriensis* DC. Prod. **3**: 472 [Man. R. M. 109].

On dry plains, up to an altitude of 2000 m.

MONTANA: Hayden, 1854 and 1859 (according to Coulter).

***Opuntia polyacantha platycarpa** (Engelm.) Coulter, Contr. U. S. Nat. Herb. **3**: 436; *O. Missouriensis platycarpa* Engelm. Syn. Cact. 300.

Like the species, but generally with only one long central spine and a few shorter exterior ones.

MONTANA: 1883, *Canby, 140* (according to Coulter); Helena, 1887, *F. D. Kelsey;* Beaver Head, *A. E. Barrett;* 1854, *Hayden.*

Opuntia fragilis (Nutt.) Haw. Syn. Pl. Succ. Suppl. 82 [Ill. Fl. **2**: 464; Man. R. M. 112; Contr. U. S. Nat. Herb. **3**: 439]; *Cactus fragilis* Nutt. Gen. **1**: 296.

Dry plains and hills.

MONTANA: 1883, *Canby* (according to Coulter).

ELAEAGNACEAE.

Lepargyraea Canadensis (L.) Greene, Pittonia, **2**: 122 [Ill. Fl. **2**: 467]; *Elaeagnus Canadensis* L. Sp. Pl. 1024; *Shepherdia Canadensis* Nutt. Gen. **2**: 240 [Man. R. M. 322].

In woods, up to an altitude of 2500 m.

MONTANA: Helena, 1892, *Kelsey;* Headwater of Jocko, 1883, *Canby, 280;* Judith River, 1882, *Canby;* Ross' Hole, 1880, *Watson.*

YELLOWSTONE PARK: 1884, *Tweedy;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 3952.*

Lepargyraea argentea (Nutt.) Greene, Pittonia, **2**: 122 [Ill. Fl. 2: 468]; *Elaeagnus argentea* Nutt. Fraser's Cat.; *Shepherdia argentea* Nutt. Gen. **2**: 241 [Man. R. M. 322].

Along streams, up to an altitude of 2000 m.

MONTANA: Livingston, 1892, *Kelsey;* Great Falls, *Williams, 384;* Teton River, 1883, *Scribner, 253;* Little Missouri, 1882, *Canby;* Fridley, 1887, *Tweedy, 50.*

Elaeagnus argentea Pursh, Fl. Am. Sept. 114 [Ill. Fl. **2**: 467; Man. R. M. 321].

Along streams, up to an altitude of 2000 m.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy, 45;* Gallatin Co., *Mrs. Alderson;* Great Falls, *Williams, 413;* Sun River, 1883, *Scribner, 254.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 446.*

ONAGRACEAE.

Epilobium suffruticosum Nutt.; Torr. & Gray, Fl. N. Am. **1**: 488 [Man. R. M. 102; Trelease, Mon.† 84].

The flowers are not white as described by Coulter, but cream-color and not small compared with the other native species. At an altitude of 1500–2500 m.

MONTANA: Hell Gate, 1860, *J. G. Cooper;* Blackfoot River, 1887, *F. D. Kelsey;* Flathead River, 1883, *Canby, 137;* Bitter Root Valley, 1880, *Watson.*

YELLOWSTONE PARK: Upper Falls, 1871, *Hayden;* Cache Creek, 1885; *Tweedy, 523.*

Epilobium paniculatum Nutt.; Torr. & Gray, Fl. N. Am. **1**: 490 [Man. R. M. 102; Trelease, Mon. 85; Bot. Cal. **1**: 220; Ill. Fl. **2**: 484].

Common throughout the valleys, up to an altitude of 2500 m.

MONTANA: Bitter Root River, 1860, *Dr. Cooper;* Little Belt Mountains, 1896, *Flodman, 658;* Spanish Basin, *659;* Jack Creek, July 14, 1897, *Rydberg & Bessey, 4571;* Meadow Creek, 1886, *Tweedy, 1050;* Bozeman, 1892, *W. T. Shaw.*

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy, 515.*

* **Epilobium paniculatum jucundum** (Gray) Trelease, Ann. Rep. Mo. Bot. Gard. **2**: 85; *Epilobium jucundum* Gray, Proc. Am. Acad. **12**: 57.

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† Trelease, Monograph of *Epilobium* in Ann. Rep. Mo. Bot. Gard. **2**.

Like the last but more glaucous and with larger flowers.

Montana: Bozeman, 1895, *Rydberg*, *2727;* Manhattan, *2728;* Great Falls, 1891, *R. S. Williams*, *289*.

Epilobium adenocaulon Hausskn. Oester. Bot. Zeitschr. **29**: 119 [Trelease, Mon. 94; Ill. Fl. **2**: 484]; *Epilobium coloratum* Wats. Bot. Cal. **1**: 218 [Man. R. M. 102]: not Muhl.

The eastern *E. coloratum* has lanceolate strongly serrate leaves with a distinct petiole and beakless seeds with a cinnamon-colored coma (when ripe). In *E. adenocaulon* the leaves are more ovate, the petiole short and winged, the coma white and the seeds short-beaked. It is common in swampy ground, up to an altitude of 2500 m.

Montana: Manhattan, 1895, *Rydberg*, *2730;* Cliff Lake, July 26, 1897, *Rydberg & Bessey*, *4555* and *4556;* Cottonwood Cañon, 1892, *W. T. Shaw;* Meadow Creek, 1886, *Tweedy*, *1049:* Ulm, 1887, *R. S. Williams*, *726;* Alhambra, 1892, *F. D. Kelsey*.

* **Epilobium adenocaulon perplexans** Trelease, Ann. Rep. Mo. Bot. Gard. **2**: 96.

Slender, subsimple, the leaves more lanceolate, mostly obtuse and only slightly serrulate.

Montana: Spanish Basin, 1895, *Flodman*, *662;* Elk Mts., *663:* Bridger Mts., *664;* Bozeman, 1895, *Rydberg*, *2732;* Granite, 1892, *Kelsey*.

* **Epilobium occidentale** (Trelease); *Epilobium adenocaulon occidentale* Trelease, Ann. Rep. Mo. Bot. Gard. **2**: 95.

Like *E. adenocaulon*, but more strict and with very glandular branches, the triangular-lanceolate leaves strongly but distantly denticulate.

Montana: Bozeman, 1895, *Rydberg*, *2731;* Spanish Basin, 1896, *Flodman*, *660;* Jack Creek, July 15, 1897, *Rydberg & Bessey*, *4549* and *4554*.

* **Epilobium glandulosum** Lehm. Pug. **2**: 14 [Trelease, Mon. 99].

Somewhat resembling *E. adenocaulon*, but the leaves broader and more crowded; stem loosely crisp-pubescent above with flexuous glandular hairs and producing (as in the four following species) subterranean fleshy winter bulblets. In swampy grounds, at an altitude of about 2000 m.

Montana: Spanish Basin, July 1, 1897, *Rydberg & Bessey*, *4557*.

* **Epilobium delicatum** Trelease, Ann. Rep. Mo. Bot. Gard. **2**: 99.

Stem slender, glabrous, except the crisp-hairy lines above and the inflorescence; leaves delicate, ovate-lanceolate, undulate, rounded at the base. It differs from *E. alpinum* mostly in the presence of the subterranean bulblets. Rare.

MONTANA: Flat Head River, 1883, *Canby, 132*, in part.

* **Epilobium brevistylum** Barbey: Brewer & Wats. Bot. Cal. **1**: 220 [Trelease, Mon. 100].

The general aspect of the plant is exceedingly like that of a more simple *E. adenocaulon*, but the leaves are thinner, the coma dingy and the propagation is by subterranean bulblets. In swampy ground, at an altitude of 2000–3000 m.

MONTANA: Helena, 1894, *E. Douglas;* Flat Head River, 1883, *Canby, 132*, in part.

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 4550* and *4552;* East De Lacy's Creek, *4551*.

* **Epilobium Halleanum** Hausskn. Monog. 261 [Trelease, Mon. 101].

Distinguished from the last by its sessile, often clasping, decurrent leaves.

MONTANA: Spanish Basin, 1896, *Flodman, 677*.

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 4561*.

* **Epilobium Drummondii** Hausskn. Monog. 271; [Trelease, Mon. 102].

Characterized by its strict stem, narrowly lanceolate subsessile leaves which are rounded at the base, but not decurrent. In rich meadows, at an altitude of 2000–2500 m.

MONTANA: Spanish Basin, July 1, 1897, *Rydberg & Bessey, 4558;* Belt Mts., 1885, *F. W. Anderson, 152;* Jefferson City, 1883, *Scribner, 56a*.

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 520*.

* Epilobium Drummondii latiusculum.

Leaves broader, ovate-lanceolate, more prominently dentate; stem often reddish, never pale as in the species.

Dr. Trelease, to whom the specimens were sent, named it *E. Drummondii*, but added: "one of the forms towards *saximontanum*." It looks quite different from the typical *E. Drummondii* and may be a distinct species or a hybrid. It was growing along a brook with *E. Halleanum*, which it also approaches.

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 4559* and *4560*.

Epilobium Hornemanii Reichenb. Icon. Crit. 2: 73 [Trelease, Mon. 105; Ill. Fl. 2: 485]; *Epilobium alpinum* Wats. Bot. Cal. 1: 217 [Man. R. M. 102].

This, as well as the three following species, is low, 1–2 dm. high, and more or less stoloniferous; it and *E. clavatum* have purplish flowers, and mostly papillose seeds; *E. Hornemanii* has larger thinner leaves than the other species, the upper being broadly ovate, often remotely serrulate, and abruptly rounded into a very short petiole. Among rocks, at an altitude of 2500–3500 m.

MONTANA: Spanish Basin, 1896, *Flodman*, *665*, *666* and *674*; Little Belt Mts., *667*; Bridger Mts., *668*; Deer Lodge, *Miss Emma Ware*; Mill Creek, 1887, *Tweedy*, *234*; Granite, 1892, *Kelsey*.

YELLOWSTONE PARK: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey*, *4570*; East De Lacy's Creek, Aug. 10, *4564* and *4565*; Soda Butte, 1885, *Tweedy*, *519*; Lower Falls, 1877, *Hayden*.

* **Epilobium alpinum** L. Sp. Pl. 348 [Trelease, Ann. Rep. Mo. Bot. Gard. 2: 108: Ill. Fl. 2: 482].

Resembling the last, but leaves and flowers smaller, the latter white or light rose. It often grows with the preceding and has frequently been confused with it.

MONTANA: Bridger Mts., 1896, *Flodman*, *669* and *671*; Little Elk Mts., *670*; Spanish Peaks, *672*; Cedar Mountain, July 16, 1897, *Rydberg & Bessey*, *4562*; Bridger Mts., June 12, *4563*; Columbia Falls, 1892, *R. S. Williams*, *880*.

* **Epilobium anagallidifolium** Lam. Encycl. Meth. 2: 376 [Trelease, Ann. Rep. Mo. Bot. Gard. 2: 110; Ill. Fl. 2: 482].

It differs from the last by the more slender s-shaped bent stem, and the smaller narrowly oval or oblong entire leaves, and grows in alpine regions, at an altitude of about 3000 m. The flowers are sometimes violet.

MONTANA: Long Baldy, Little Belt Mts., 1896, *Flodman*, *673*; Electric Peak, Aug., 1897, *Rydberg & Bessey*, *4566*.

* **Epilobium clavatum** Trelease, Ann. Rep. Mo. Bot. Gard. 2: 111.

This resembles *E. Hornemanii* in the color of the flowers and the papillose seeds, but the flowers are smaller. In the leaves and general habit it most resembles the preceding, from which it is often hard to distinguish. The plant is much more cespitose than either and forms rather large mats in gravelly or rocky places near the tops of the higher mountains, at an altitude of about 3000 m.

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey*, *4567* and *4568;* Soda Butte Creek, 1885, *Tweedy*, *521*.

MONTANA: Cedar Mountains, July 16, 1897, *Rydberg & Bessey*, *4569;* Mill Creek, 1887, *Tweedy*, *235*.

Chamaenerion angustifolium (L.) Scop. Fl. Carn. Ed. 2, **1**: 271 [Ill. Fl. **2**: 481]: *Epilobium angustifolium* L. Sp. Pl. 347; *Epilobium spicatum* Lam. Fl. Franc. **3**: 482 [Man. R. M. 101: Trelease, Ann. Rep. Mo. Bot. Gard. **2**: 80; Bot. Cal. **1**: 218].

In valleys and open woods, up to an altitude of 2500 m.

MONTANA: Forks of the Madison, July 26, 1897, *Rydberg & Bessey*, *4548;* Emigrant Gulch, Aug. 23, *4547;* Helena, 1891, *Kelsey;* Bear Creek Cañon and West Gallatin, 1892, *W. T. Shaw;* Silver Bow Co., *Mrs. Christie;* Fort Ellis to the Yellowstone, 1871, *Hayden Survey;* Jefferson City, 1883, *Scribner*, *56b*.

YELLOWSTONE PARK: Pelican Creek, 1885, *F. Tweedy*, *524*.

Chamaenerion latifolium (L.) Sweet, Hort. Brit. Ed. 2, 198 [Ill. Fl. **2**: 481]: *Epilobium latifolium* L. Sp. Pl. 347 [Man. R. M. 102; Trelease, Ann. Rep. Mo. Bot. Gard. **2**: 81; Bot. Cal. **1**: 219].

Rare, growing at an altitude of 2000–3000 m.

MONTANA: Belt River, 1886, *R. S. Williams*, *147;* Blackfoot River, 1883, *Canby*, *131*.

YELLOWSTONE PARK: Soda Butte Creek and Cache Creek, 1885, *Tweedy*, *522*.

* **Boisduvallia glabrella** (Nutt.) Walp. Rep. **2**: 89 [Trelease, Ann. Rep. Mo. Bot. Gard. **5**: 117; Bot. Cal. **1**: 233]; *OEnothera glabella* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 505.

A small plant belonging to a genus distinguished from the *OEnothera* series by the short basifixed anthers and erect calyx-lobes. From *Epilobium* it is mainly distinguished by the lack of coma. Flowers in subterminal spikes, shorter than the subtending leaves; corolla violet.

MONTANA: Sand Coulee, 1891, *R. S. Williams*, *773;* 1887, *F. W. Anderson;* Deer Lodge, 1892, *Notestein*.

* Onagra strigosa.

Biennial; stems 4–10 dm. high, grayish strigose and somewhat villous on the upper part; leaves grayish strigose, first ones obovate or spatulate and obtuse, the lower stem-leaves broadly oblanceolate, acute, 5–10 cm. long, more or less wavy, the upper ones lanceolate and smaller; spike leafy, many-flowered; flowers 6–7 cm. long; ovary and tube somewhat pilose, the latter about 3cm. long and 2–3 mm. wide; sepals linear-lanceolate, acuminate, in bud gradually contracted into the short free tips; petals obcordate, 1.5–2 cm. long and almost as broad; capsule 3–4 cm. long, inverted club-shaped; seeds irregular, obtusely angled, reddish brown, about 2 mm. long.

Nearest related to *O. Hookeri*, but differs in the much smaller flowers, which are always pure yellow, never tinged with rose. From *O. biennis* and *O. Oakesiana* it differs in the grayish short-strigose pubescence. It grows in rich soil, in meadows, creek banks, borders of fields, etc.

MONTANA: Pony, July 8 and 12, 1897, *Rydberg & Bessey, 4584;* Meadow Creek, July 12, *4583;* Spanish Basin, 1896, *Flodman, 680;* Cottonwood Creek, 1892, *W. F. Shaw;* Helena, 1887, *Kelsey;* Mill Creek, 1887, *Tweedy, 236;* Teton River, 1883, *Scribner, 57.*

* Onagra strigosa subulata.

Like the species, but the sepals in bud abruptly contracted into long subulate free tips.

MONTANA: Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 4588.*

* **Onagra** † **Hookeri** (Torr. & Gray) Small, Bull. Torr. Bot. Club, **23**: 171; *OEnothera Hookeri* Torr. & Gray, Fl. N. Am. **1**: 493; *OE. biennis hirsutissima* Gray, Pl. Fend. 43 [Bot. Cal. **1**: 223].

Like the preceding, but the more hirsute flowers much larger and generally tinged with red. Rare.

MONTANA: Silver Bow Co., *Miss Louise Hammond* (Small-flowered.)

* **Onagra depressa** (Greene) Small, Bull. Torr. Bot. Club, **23**: 170; *OEnothera depressa* Greene, Pittonia, **2**: 216.

Resembling somewhat *O. strigosa*, but prostrate, the leaves broader, elliptic-lanceolate, and with a much denser pubescence.

MONTANA: Custer, *Blankinship.*

Anogra albicaulis (Pursh) Britton, Mem. Torr. Bot. Club, **5**: 234 [Ill. Fl. **2**: 488]; *OEnothera albicaulis* Pursh, Fl. Am. Sept. 733; *O. pinnatifida* Nutt. Gen. **1**: 245 [Man. R. M. 103].

Sandy plains and prairies, up to an altitude of 1500 m.

MONTANA: Big Horn River, 1892, *Tweedy;* Crow Indian Reservation, 1891, *Tweedy;* Lewis & Clarke Co., *Mrs. Fannie Harwood;* Custer Co., 1892, *Mrs. Light.*

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† The characters of the various genera formerly included in *OEnothera* are pointed out by Dr. J. K. Small in Bull. Torr. Bot. Club, **23**: 167–194.

Anogra pallida (Lindl.) Britton, Mem. Torr. Bot. Club, **5**: 234 [Ill. Fl. **2**: 489]; *OEnothera albicaulis* Nutt. Fraser Cat. (name only) [Man. R. M. 104; Bot. Cal. **1**: 223]; not Pursh; *OE. pallida* Lindl. Bot. Reg. **14**: *pl. 1142.*

In sand draws, river banks, cañons, etc., up to an altitude of 2000 m.

Montana: Pony, July 6, 1897, *Rydberg & Bessey, 4585*: Gallatin Co., *Mrs. Alderson;* Madison Co., 1886, *Tweedy, 1051;* Sand Coulee, 1884, 1887, *F. W. Anderson;* Great Falls, 1891, *R. S. Williams, 152;* Fort Ellis to the Yellowstone, 1871, *Hayden:* Smith River, 1883, *Scribner, 58.*

Pachylophus caespitosa (Nutt.) Raiman, in Engler & Prantl, Nat. Pfl. Fam. **3**: abt. 7, 215 [Ill. Fl. **2**: 492]; *OEnothera caespitosa* Nutt. Fras. Cat.; Torr. & Gray, Fl. N. Am. **1**: 500 [Man. R. M. 104; Bot. Cal. **1**: 224].

Dry hills and "bad-lands," at an altitude of 1000 to over 2000 m.

Montana: Deer Lodge, 1888, *F. W. Traphagen;* Beaver Head Co., 1888, *F. Tweedy, 97:* Madison Co., *Mrs. Flora McNulty;* Great Falls, 1891, *R. S. Williams, 12;* Custer Co., 1892, *Mrs. Light;* Yellowstone Valley, 1882, *Canby* (small-flowered): Shields River, 1883, *Scribner, 58b* (= *marginata*); Billings, 1882, *Canby* (small); Priest's Rapids, 1883, *Canby, 784* (large): Shinberger Cañon, 1880, *Watson.* These specimens may represent more than one species.

Yellowstone Park: Mammoth Hot Springs, 1885, *Tweedy, 514.*

Lavauxia triloba (Nutt.) Spach, Hist. Veg. **4**: 367 [Ill. Fl. **2**: 493]; *OEnothera triloba* Nutt. Journ. Acad. Phila. **2**: 118; Torr. & Gray, Fl. N. Am. **1**: 499 [Man. R. M. 104; Bot. Cal. **1**: 224].

Dry grounds, at an altitude of 1000–2500 m.

Montana: Helena, 1891, *F. D. Kelsey:* Lima, 1895, *Rydberg, 2734;* Great Falls, 1885, *F. W. Anderson, 158;* Great Falls, 1891, *R. S. Williams, 299;* Madison River, 1883, *Scribner, 58a.*

Taraxia breviflora (Torr. & Gray) Nutt.; Torr. & Gray, Fl. N. Am. **1**: 506; *OEnothera breviflora* Torr. & Gray, Fl. N. Am. **1**: 506 [Man. R. M. 104; Bot. Cal. **1**: 224].

Valleys, especially in sandy soil, up to an altitude of 2500 m.

Montana: Little Belt Mts., 1896, *Flodman, 679.*

Yellowstone Park: Indian Creek, 1884, *Tweedy, 551;* 1873, *C. C. Parry, 113.*

* **Taraxia subacaulis** (Pursh); *Jussiaea subacaulis* Pursh, Fl. Am. Sept. 304; *Taraxia heterantha* (Nutt.) Small, Bull. Torr. Bot. Club, **23**: 185; *OEnothera heterantha* Nutt. Journ. Acad. Phila. **7**: 22 [Bot. Cal. **1**: 224].

A larger plant than *T. breviflora*, with subentire or sinuately toothed, not pinnatifid, leaves. Rather common in rich soil in the valleys, at an altitude of 2000–3000 m.

MONTANA: Rocky Mts., *Wyeth;* Bridger Mts., June 12, 1897, *Rydberg & Bessey, 4587;* Spanish Basin, June 30, *4586;* Bozeman, 1889, *Mrs. Alderson.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* 1883, *Miss Mary Compton;* Swan Lake and Mammoth Hot Springs, 1885, *Tweedy, 513.*

Meriolix serrulata (Nutt.) Walp. Rep. **2**: 79 [Ill. Fl. **2**: 496]; *OEnothera serrulata* Nutt. Gen. **1**: 246 [Torr. & Gray, Fl. N. Am. **1**: 501; Man. R. M. 105].

On dry hills and plains, up to an altitude of 2000 m.

MONTANA: Bozeman and Cinnabar, 1884, *Tweedy, 54.*

Sphaerostigma andinum (Nutt.) Walp. Rep. **2**: 79; *OEnothera andina* Nutt.: Torr. & Gray, Fl. N. Am. **1**: 512 [Man. R. M. 105; Bot. Cal. **1**: 226].

In dry soil.

MONTANA: Blackfoot River, *Nuttall.*

YELLOWSTONE PARK: 1873, *Parry, 111.*

Clarkia pulchella Pursh, Fl. Am. Sept. 260 [Torr. & Gray, Fl. N. Am. **1**: 515; Man. R. M. 105; Bot. Cal. **1**: 231].

In the very western part of the State.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 881;* Jocko Indian Agency, 1883, *Canby.*

* **Gayophytum lasiospermum** Greene, Pittonia, **2**: 164 [Trelease, Ann. Rep. Mo. Bot. Gard. **5**: 109].

Like *G. ramosissimum*, but with strigose-canescent seeds. Dry hills, at an altitude of 2500 m.

MONTANA: Lima, 1895, *Rydberg, 2734.*

* **Gayophytum diffusum** Torr. & Gray, Fl. N. Am. **1**: 513 [Trelease, Ann. Rep. Mo. Bot. Gard. **5**: 110; Bot. Cal. **1**: 221].

Somewhat resembling *G. ramosissimum*, but generally more branched; flowers larger, the petals 3–6 mm. long. Dry hillsides, at an altitude of 2000–2500 m.

MONTANA: Pony, July 9, 1897, *Rydberg & Bessey, 4581;* Gallatin Co., 1886, *Tweedy, 1048.*

YELLOWSTONE PARK: Biscuit Basin, Aug. 5, 1897, *Rydberg & Bessey, 4580;* Yellowstone Lake, 1884, *Tweedy;* 1871, *R. Adams.*

Gayophytum ramosissimum Torr. & Gray, Fl. N. Am. **1**: 513 [Trelease, Ann. Rep. Mo. Bot. Gard. **5**: 111: Man. R. M. 103; Bot. Cal. **1**: 221].

Common in dry or sandy soil, up to an altitude of 3000 m.

MONTANA: Elk Mountains, 1896, *Flodman, 678;* Spanish Basin, *677;* Indian Creek, July 21, 1897, *Rydberg & Bessey, 4576;* Spanish Basin, June 23 and 24, *4573, 4574;* Pony, July 9, *4579;* Bozeman, 1887, *Tweedy, 233;* Tiger Butte, 1886, *R. S. Williams, 483;* Alhambra, 1892, *Kelsey;* Birch Lakes, 1883, *Canby, 133.*

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 4577;* Biscuit Basin, Aug. 5, *4578;* Yellowstone Falls, Aug. 14, *4572;* Yellowstone Lake, 1884, *Tweedy;* 1891, *Miss Cooley.*

Gayophytum caesium Nutt.; Torr. & Gray, Fl. N. Am. **1**: 514 [Trelease, Ann. Rep. Mo. Bot. Gard. **5**: 113]; *Gayophytum racemosum* Torr. & Gray, l. c. [Man. R. M. 103; Bot. Cal. **1**: 221].

In sandy soil, at altitude of 1000–2500 m.

MONTANA: Spanish Basin, June 23, 1897, *Rydberg & Bessey, 4582;* Blackfoot River, *Nuttall.*

YELLOWSTONE PARK: Tower Falls, 1885, *Tweedy, 516;* Mud Springs, *Hayden Survey.*

* **Gayophytum pumilum** Wats. Proc. Am. Acad. **18**: 193 [Trelease, Ann. Rep. Mo. Bot. Gard. **5**: 114].

Like *G. caesium*, but lower, generally with comparatively larger leaves, and a broadly oblong pod, flattened contrary to the septum. A few specimens that apparently belong to this species were found on the volcanic sand bars of Shoshone Lake; altitude about 2500 m.

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 4575.*

Gaura coccinea Pursh, Fl. Am. Sept. 733 [Torr. & Gray, Fl. N. Am. **1**: 518; Man. R. M. 106; Ill. Fl. **2**: 497].

On dry plains, common up to an altitude of 2000 m.

MONTANA: Gallatin Co., 1887, *F. Tweedy, 232;* Pony, July 6, 1897, *Rydberg & Bessey, 4589;* Cottonwood Creek, 1892, *W. T.*

Shaw; Gallatin Co., *Mrs. Hodgman;* Lower Missouri Falls, 1885, *R. S. Williams, 271;* Beaver Head Cañon, 1888, *Tweedy, 98;* Bozeman, 1886, *1047;* Cinnabar, 1884, *53;* Custer Co., 1897, *Mrs. Light;* Belt Mountains, 1882, *Canby;* Madison River, 1883, *Scribner, 58d;* Hell Gate Cañon, 1880, *Watson.*

* **Gaura glabra** Lehm.; Hook. Fl. Bor. Am. **1**: 209; *Gaura coccinea glabra* Torr. & Gray, Fl. N. Am. **1**: 518.

Like *G. coccinea*, but glabrous; bark of the older stems yellowish white and shreddy; bracts longer and linear-subulate; flowers generally dark blood-red, but specimens with light pink flowers are sometimes met with. On dry plains and hills, preferring sandy soil.

MONTANA: Alhambra, 1887, *Kelsey;* Pony, July 6, 1897, *Rydberg & Bessey, 4590.*

Gaura parviflora Dougl.; Lehm. in Hook. Fl. Bor. Am. **1**: 208 [Torr. & Gray, Fl. N. Am. **1**: 519; Man. R. M. 106; Ill. Fl. **2**: 496; Bot. Cal. **1**: 234].

In rich soil on bottom lands and prairies, up to an altitude of perhaps 1500 m.

MONTANA: Great Falls, 1886, *R. S. Williams, 390;* Custer Co., 1892, *Mrs. Light;* Crow Creek, 1883, *Scribner, 58c.*

Circaea Pacifica Aschers. & Magn. Bot. Zeit. **29**: 392 [Man. R. M. 106; Bot. Cal. **1**: 234].

Among bushes, in rich soil.

MONTANA: Prickly Pear Cañon, 1887, *R. S. Williams, 650;* Upper Marias Pass, 1883, *Canby, 138.*

* **Circaea alpina** L. Sp. Pl. 9 [Torr. & Gray, Fl. N. Am. **1**: 527; Ill. Fl. **2**: 500].

It is difficult to distinguish between this and the preceding, and they may be but forms of one variable species. The eastern specimens seem to be easily separated from those of the Pacific Coast, but in the Rocky Mountain region they seem to run more or less together. *C. alpina* is generally a much smaller plant with more sharply dentate leaves.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy, 41.*

HALORAGIDACEAE.

Myriophyllum spicatum L. Sp. Pl. 992 [Torr. & Gray, Fl. N. Am. **1**: 529; Man. R. M. 99; Ill. Fl. **2**: 503; Bot. Cal. **1**: 215].

In lakes and ponds, up to an altitude of 2000 m.

MONTANA: Cliff Lake, July 27, 1897, *Rydberg & Bessey, 4591;* Madison River, 1886, *Tweedy, 1098.*

Myriophyllum verticillatum L. Sp. Pl. 992 [Torr. & Gray, Fl. N. Am. **1**: 529; Man. R. M. 100; Ill. Fl. **2**: 503].

Lakes and ponds, up to an altitude of 2500 m.

YELLOWSTONE PARK: Broad Creek, 1885, *Tweedy, 426.*

Hippurus vulgaris L. Sp. Pl. 4 [Torr. & Gray, Fl. N. Am. **1**: 531; Man. R. M. 99; Ill. Fl. **2**: 501; Bot. Cal. **1**: 215].

In swamps, up to an altitude of 2500 m.

MONTANA: Deer Lodge, 1895, *Rydberg, 2736;* Belt River, 1886, *R. S. Williams, 355; John Pearsall, 865.*

YELLOWSTONE PARK: Lewis Lake, 1884, *F. Tweedy, 29;* Upper Madison Cañon, Aug. 3, 1897, *Rydberg & Bessey, 4592.*

ARALIACEAE.

Aralia nudicaulis L. Sp. Pl. 274 [Torr. & Gray, Fl. N. Am. **1**: 646; Man. R. M. 122; Ill. Fl. **2**: 506].

On wooded hillsides.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 882.*

Echinopanax horridum (Smith) Dec. & Planch. Rev. Hortic. **1854**: 105: *Panax horridum* Smith, Rees Cycl. [Torr. & Gray, Fl. N. Am. **1**: 648]; *Fatsia horrida* Benth. & Hook. Gen. Pl. **1**: 938 [Man. R. M. 122; Bot. Cal. **1**: 273].

In woods west of the main range of the Rockies.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 883.*

UMBELLIFERAE.

Angelica pinnata Wats. King's Exp. **5**: 126 [Man. R. M. 118; Coulter & Rose, Rev. N. A. Umb. 36].

In wet meadows, at an altitude of about 2500 m.

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4609;* Lone Star Geyser, Aug. 7, 1897, *4602* and *4606;* 1884, *Tweedy, 3.*

Angelica Lyallii Wats. Proc. Am. Acad. **17**: 374 [Man. R. M. 118; Coulter & Rose, Rev. N. A. Umb. 36].

In wet meadows, at an altitude of 2000–2500 m.

MONTANA: Indian Creek, July 21, 1897, *Rydberg & Bessey, 4604;* Forks of the Madison, July 26, *4603;* Lone Mountain, 1886, *Tweedy, 1056;* Silver Bow, *Mrs. Moore;* Upper Box Elder Creek, 1886, *R. S. Williams, 379;* White Gulch, Belt Mts., 1882, *Canby;* Flathead, 1883, *Canby, 146;* Sand Coulee, 1883, *Scribner, 65;* Missoula, 1880, *Watson.*

YELLOWSTONE PARK: Lone Star Geyser, Aug. 7, 1897, *Rydberg & Bessey, 4607* and *4608;* Yellowstone Lake, 1885, *Tweedy, 860.*

Heracleum lanatum Michx. Fl. Bor. Am. **1**: 166 [Man. R. M. 121; Coulter & Rose, Rev. N. A. Umb. 48; Ill. Fl. **2**: 514; Bot. Cal. **1**: 271].

Rather common in cañons and on river banks, up to an altitude of 2500 m.

MONTANA: Indian Creek, July 21, 1897, *Rydberg & Bessey, 4594;* Bridger Mts., June 18, *4593;* Helena, 1890, *F. D. Kelsey;* East Boulder, 1887, *Tweedy, 202;* Belt Creek, 1883, *Scribner, 64.*

YELLOWSTONE PARK: 1885, *Tweedy, 859.*

* **Pastinaca sativa** L. Sp. Pl. 262 [Coulter & Rose, Rev. N. A. Umb. 49; Ill. Fl. **2**: 514].

The common parsnip is sometimes found escaped from cultivation.

MONTANA: Helena, 1889, *F. D. Kelsey.*

* **Coloptera Parryi** Coulter & Rose, Rev. N. A. Umb. 50.

A low plant, resembling a species of *Cymopterus*, not unlike *C. acaulis* in habit and fruit, but the lateral wings are thickened, as in *Leptotaenia.* It is a rare mountain plant.

MONTANA: Gallatin Co., 1888, *Tweedy, 2;* Custer Co., 1892, *Mrs. Light.*

Leptotaenia multifida Nutt.; Torr. & Gray, Fl. N. Am. **1**: 630 [Coulter & Rose, Rev. 51]; *Ferula multifida* Gray, Proc. Am. Acad. **7**: 348 [Bot. Cal. **1**: 271; Man. R. M. 121].

On mountain sides in rich, damp soil, at an altitude of 2000–2500 m.

MONTANA: Bridger Mts., 1896, *Flodman, 686;* Bridger Mts., June 12–18, 1897, *Rydberg & Bessey, 4612* and *4613;* Livingston, 1886, *Tweedy;* Grizzly Creek, 1887, *Tweedy, 205;* Silver Bow Co., *Mrs. Moore;* Helena, 1892, *Kelsey;* Ross' Hole, 1880, *Watson.*

* **Peucedanum Cous** Wats. Proc. Am. Acad. **21**: 453 [Coulter & Rose, Rev. 58].

A low plant, with a thick tuberous farinaceous root used for food by the Indians, yellow flowers, puberulent fruit with solitary oil tubes in the intervals, and twice pinnate leaves with linear-oblong segments. Rather common in rich soil, at an altitude of 2000–2500 m.

MONTANA: Bridger Mts., June 11–15, 1897, *Rydberg & Bessey*, *4620*, *4624* and *4627*; Spanish Basin, June 26, *4619*.

* **Peucedanum circumdatum** Wats. Proc. Am. Acad. **22**: 474 [Coulter & Rose, Rev. 59].

Resembling the preceding, but with glabrous fruit, and the leaves more inclined to be ternate and the leaflets 1–2-pinnately divided. It grows in about the same situations as the preceding.

MONTANA: Madison Co., 1886, *Tweedy*, *3*; Gardiner, 1885, *854*; Bozeman, *Scribner*, *66a*; Little Belt Mts., *66*; Belt River Cañon, *Williams*, *149*; Bozeman Pass and Little Blackfoot River, *Canby*, *152*; Grafton & Sand Coulee, 1887, *R. S. Williams*, *149* (?).

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy*, *854*.

Peucedanum ambiguum Nutt.; Torr. & Gray, Fl. N. Am. **1**: 626 [Man. R. M. 120; Coulter & Rose, Rev. 58; Bot. Cal. **1**: 269]: *Eulophus ambiguus* Nutt. Journ. Acad. Phila. **7**: 27.

In open valleys and on hillsides, up to an altitude of 2000–2500 m.

MONTANA: Bozeman, 1895, *Rydberg*, *2744*; Spanish Basin, 1896, *Flodman*, *692* and *693*; Bridger Mts., *694*; June 18, 1897, *Rydberg & Bessey*, *4623*; Spanish Basin, June 24, 1897, *Rydberg & Bessey*, *4622*; Gallatin Co., 1886, *Tweedy*, *1057*; Bear Gulch, 1887, *211*; Granite, 1892, *Kelsey*; Flat Head River, *Wyeth* (type); Belt Mts., 1883, *Scribner*, *66a*; Bozeman, 1883, *Canby*, *151*; Jocko River, *151*; Hell Gate, 1880, *Watson*.

YELLOWSTONE PARK: 1883, *Miss Mary Compton*; Slough Creek, 1885, *Tweedy*, *851*.

Peucedanum macrocarpum Nutt.; Torr. & Gray, Fl. N. Am. **1**: 627 [Man. R. M. 120; Coulter & Rose, Rev. 60; Bot. Cal. **1**: 270].

Hillsides, at altitude of 2000–2500 m.

MONTANA: Indian Creek, July 21, 1897, *Rydberg & Bessey*, *4614*; Deer Lodge Co., *Miss E. Ware*; Bozeman, 1882, *Tweedy*; 1887, *208*; Silver City, 1890, *Kelsey*; Sand Coulee, 1881, *R. S. Williams*, *148*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy*, *855*.

Peucedanum villosum Nutt.; Wats. King's Exp. **5**: 131 [Man. R. M. 120; Coulter & Rose, Rev. 64; Bot. Cal. **1**: 270].

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Great Falls, 1892, *R. S. Williams, 150;* Deer Lodge, *Miss Frances Hobson;* Madison Co., 1888, *Tweedy, 4;* Northern Pacific R. R., 1882, *Tweedy, 287.*

* **Peucedanum Sandbergii** Coulter & Rose, Bot. Gaz. **13**: 79 [Rev. 65].

A more or less caulescent puberulent plant, with yellow flowers, much inflated and scarious margined petioles, and compound ternately or pinnately dissected leaves with very short linear divisions. Rare.

MONTANA: Upper Marias Pass and Little Blackfoot River, *Canby, 153.*

* **Peucedanum triternatum** Nutt.; Torr. & Gray, Fl. N. Am. **1**: 626.

Like *P. simplex*, but with broader segments to the leaves, and a narrow wing less than half as wide as the fruit.

MONTANA: Grasshopper Valley and Big Hole Valley, 1880, *Watson.*

Peucedanum simplex Nutt.; Wats. King's Exp. **5**: 129 [Man. R. M. 120; Coulter & Rose, Rev. 69; Bot. Cal. **1**: 269]; *Peucedanum triternatum platycarpum* Torr. Stansb. Rep. 389; not *P. platycarpum* E. Mey.

Dry hills, at an altitude of 1000–2500 m.

MONTANA: Bozeman, 1895, *Rydberg, 2741;* Spanish Basin, June 24, 1897, *Rydberg & Bessey, 4621;* Forks of the Madison, 1897, *4617;* Pony, July 6, *4618;* Great Falls, 1891, *R. S. Williams, 10;* Deer Lodge, 1888, *F. W. Traphagen;* Helena, 1890, *Kelsey;* Bozeman, 1882, *Tweedy;* Trail Creek, 1887, *207;* Lewis and Clarke Co., *Mrs. E. Muth;* Little Blackfoot River, 1883, *Canby, 148½* and *149;* Madison River, 1883, *Scribner, 66b.*

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 852.*

* **Peucedanum Nevadense** Wats. Proc. Am. Acad. **9**: 143 [Bot. Cal. **1**: 270].

Characterized by its white flowers, pubescent orbicular fruit with prominent ribs and the glaucous more or less puberulent stem. Dry mountains, at an altitude of 2500 m.

MONTANA: Lima, 1895, *Rydberg, 2740.*

Pseudocymopterus bipinnatus (Wats.) Coulter & Rose, Rev. N. A. Umb. 75: *Cymopterus bipinnatus* Wats. Proc. Am. Acad. **20**: 368 [Man. R. M. 119].

Dry hills, at an altitude of 1500–2500 m.

MONTANA: Pole Creek, July 4, 1897, *Rydberg & Bessey, 4628;* Cedar Mountain, July 16, *4629* and *4630;* Helena, 1891, *S. A. Merritt* and *F. D. Kelsey;* Madison Co., 1888, *Tweedy, 1;* Mill Creek, 1887, *212;* Silver Bow Co., *Mrs. Jennie Moore;* N. Pac. R. R., 1882, *Tweedy, 291;* Mt. Helena, 1883, *Canby, 148;* Shields River, 1883, *Scribner, 66c;* Bannock City, 1880, *Watson;* Virginia City, 1871, *Hayden Survey.*

Musineon divaricatum (Pursh) Nutt.; Torr. & Gray, Fl. N. Am. **1**: 642 [Ill. Fl. **2**: 527; Man. R. M. 114; Coulter & Rose, Rev. 110]: *Seseli divaricatum* Pursh, Fl. Am. Sept. 732.

On dry plains, up to an altitude of 2000 m.

MONTANA: Upper Missouri, *Nuttall.*

Musineon Hookeri Nutt.: Torr. & Gray, Fl. N. Am. **1**: 64; *Musenium divaricatum Hookeri* Torr. & Gray, l. c. [Man. R. M. 115].

Hillsides, up to an altitude of 2500 m.

MONTANA: Pole Creek, July 4, 1897, *Rydberg & Bessey, 4615;* Lewis and Clarke Co., *Mrs. Muth* and *Mrs. Murphy;* Great Falls, 1885, *F. W. Anderson, 166;* Madison Co., 1885, *Tweedy, 139;* Great Falls, 1889, *R. S. Williams, 16;* Helena, 1891, *Kelsey;* Gardiner, 1885, *Tweedy, 853;* Mt. Helena, 1883, *Canby, 154;* Beaver Head Co. and Grasshopper Valley, 1880, *Watson.*

* Musineon vaginatum.

Stem less than 1 dm. high, from a thick perennial root, glabrous, striate, more or less purple-tinged, 2–3-leaved: basal leaves with petioles about 5 cm. long, twice or thrice ternate with stalked divisions (stalk of the terminal one longest), glabrous; divisions divided into linear or linear-oblong obtuse segments about 5 mm. long: stem leaves similar, short-petioled, and with a very conspicuous purple and scarious-margined sheath; umbel 1–2 cm. in diameter, with several rays; involucre none; involucels of linear bracts nearly as long as the pedicels; sepals evident; petals white or sometimes yellowish; mature fruit not seen; young fruit with strong angles but no wings, a little compressed laterally; oil-tubes apparently 3 in the intervals; seed-face plane; stylopodium depressed.

As no mature fruit has been seen, the species may not belong to *Musineon*, but the young fruit apparently suggests that genus. The seed-face is described as being concave in the genus, but at least one species, *M. tenuifolium*, has this plane. Dr. Rose, to whom all my umbellifers had been sent for determination, writes that the species is unknown to him. It grows among rocks on the mountain tops, at an altitude of 2500–3000 m.

MONTANA: Bridger Mountains, June 15, 1897, *Rydberg & Bessey*, *4626* (type) and *4625* (a single specimen taller and with yellowish flowers); 1887, *Flodman*, *695*.

Bupleurum Americanum Coulter & Rose, Rev. N. Am. Umb. 115; *Bupleurum ranunculoides* Hook. Fl. Bor. Am. 1: 263 [Man. R. M. 116]; not L.

On the mountains, at an altitude of 2000–3300 m.

MONTANA: Lima, 1895, *Rydberg*, *2738*; Spanish Basin, 1896, *Flodman*, *682*; Little Belt Mts., *683* and *684*; Electric Peak, Aug. 18, 1897, *Rydberg & Bessey*, *4600*; Indian Creek, July 21, *4599*; East Boulder, 1887, *Tweedy*, *206*; Mt. Blackmore, 1886, *1055*, in part; Tenderfoot Creek, 1890, *R. S. Williams*, *197*; Mill Creek, 1887, *206*; Smith River, 1883, *Scribner*, *62*; Martindale, 1882, *Canby*.

Washingtonia longistylis (Torr.) Britt.; Britt. & Brown, Ill. Fl. 2: 530; *Myrrhis longistylis* Torr. Fl. U. S. 310; *Osmorrhiza longistylis* DC. Prod. 4: 232 [Man. R. M. 116; Coulter & Rose, Rev. 118].

In woods, up to an altitude of 1000 m.

MONTANA: Lower Falls of Missouri, 1886, *R. S. Williams*, *275*.

* Washingtonia intermedia.

Perennial, with a somewhat fleshy taproot and a short caudex; stem 4–8 dm. high, striate, sparingly villous; leaves twice or thrice ternate, the basal one with a petiole 1–2 dm. long, striate and somewhat villous, the lower stem-leaves short-petioled, the uppermost sessile; primary divisions with petioles 1–2 cm. long, the ultimate subsessile, rhombic-ovate, acute, cleft and coarsely and acutely serrate, the teeth ovate and mucronate; umbel mostly 3-rayed; rays ascending, in fruit 3–7 cm. long; bracts 1–2, linear-subulate, or none; umbellets 3–6-rayed; bractlets generally none or minute; fruit 10–15 mm. long, nearly straight, clavate, thickest about one-fourth from the apex, tapering to both ends; style 0.75–0.8 mm. long; stylopodium ovate-conic.

Resembles *W. nuda* and *W. divaricata* in the absence of bractlets, but has a longer style and the fruit is more acute at the upper end. It differs from the former in the shape of the leaf-segments, which in *W. nuda* are more rounded and with rounder teeth. The form of the leaf is most like that of *W. longistylis* and of the fruit most like that of *W. Claytoni*. In *W. divaricata*, which is really its nearest ally, the pedicels are divergent in fruit at nearly right angles, the fruit generally decidedly curved and thickest near the apex and the stylopodium more depressed.

In rich woods, at an altitude of 500–2000 m.

MONTANA: Bridger Mts., June 17, 1897, *Rydberg & Bessey, 4595.*

It has also been collected at the following localities:

IDAHO: Lewiston, 1896, *A. A.* and *E. Gertrude Heller, 3137;* Lake Waha, *3385.*

WASHINGTON: Upper Valley of the Nesqually, 1893, *O. D. Allen, 34;* Observatory Inlet, *Dr. Scouler, 139.*

* **Washingtonia divaricata** (Nutt.) Britt.; Britt. & Brown, Ill. Fl. **2**: 531; *Osmorrhiza divaricata* Nutt.: Torr. & Gray, Fl. N. Am. **1**: 639 (name only): *O. nuda* Wats. Bot. Cal. **1**: 262, in part [Man. R. M. 116; Coulter & Rose, Rev. 117, in part].

It differs from the true *W. nuda* of California in the smaller leaflets and the long divergent branches of the primary umbel. On wooded hillsides, up to an altitude of 2000 m.

MONTANA: Bozeman, 1895, *Rydberg, 2742;* Spanish Basin, 1896, *Flodman, 687;* Bridger Mts., June 17 and 18, 1897, *Rydberg & Bessey, 4596;* Sun River Cañon, 1887, *R. S. Williams, 615;* Flathead Lake, 1883, *Canby, 143.*

YELLOWSTONE PARK: 1885, *Tweedy, 857.*

Glycosma occidentalis Nutt.: Torr. & Gray, Fl. N. Am. **1**: 639 [Man. R. M. 117; Bot. Cal. **1**: 262]; *Osmorrhiza occidentalis* Torr. Bot. Mex. Bound. 71 [Coulter & Rose, Rev. 119].

Rich soil, especially on the mountain sides, up to an altitude of 2500 m.

MONTANA: Bozeman, 1895, *Rydberg, 2743;* Spanish Basin, 1896, *Flodman, 688;* Bridger Mts., *689* and *690;* June 11, 1897, *Rydberg & Bessey, 4597;* Spanish Basin, 1892, *Kelsey;* Mill Creek, 1887, *Tweedy, 204;* Belt Mts., 1886, *R. S. Williams, 197;* Fort Ellis to the Yellowstone, 1871, *Hayden Survey;* Jocko River, 1883, *Canby, 144;* Ross' Hole, 1880, *Watson.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 4598.*

Sium cicutaefolium Gmel. Syst. **2**: 482 [Ill. Fl. **2**: 532; Man. R. M. 116; Bot. Cal. **1**: 261; Coulter & Rose, Rev. 123].

In water, up to an altitude of 2500 m.

Montana: East Gallatin Swamps, 1895, *Flodman, 685;* Ennis, 1886, *Tweedy, 1054.*

Yellowstone Park: Upper Madison Cañon, Aug. 3, 1897, *Rydberg & Bessey, 4601.*

Zizia cordata (Walt.) DC. Prod. **4**: 100 [Ill. Fl. **2**: 535; Coulter & Rose, Rev. 127]; *Thaspium trifoliatum* Coulter, Man. R. M. 117; not Gray.

Montana: Sun River, 1887, *R. S. Williams, 378.*

* **Carum Carui** L. Sp. Pl. 263 [Ill. Fl. **2**: 535; Coulter & Rose, Rev. 129].

The Caraway of the gardens, sometimes escaped from cultivation.

Montana: Blackwell's Ranch, 1892, *Brandegee.*

Carum Gairdneri (Hook. & Arn.) Gray, Proc. Am. Acad. **7**: 344 [Man. R. M. 115; Bot. Cal. **1**: 259; Coulter & Rose, Rev. 128]; *Atenia Gairdneri* Hook. & Arn. Bot. Beechey, 349; *Edosmia Gairdneri* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 612.

In meadows and on lower hillsides, up to an altitude of 2500 m. The root is sweet-tasting and used for food by the Indians.

Montana: Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 4632;* Lima, 1895, *Rydberg, 2739;* Elliston, 1890, *Kelsey;* Sand Coulee, 1891, *R. S. Williams, 198;* Park Co., 1887, *Tweedy, 201;* Bear Creek Cañon, 1892, *W. T. Shaw.*

Yellowstone Park: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey, 4633;* 1884, *Tweedy, 4;* Yellowstone Lake, 1871, *R. Adams;* Judith Mountains, 1882, *Canby.*

* **Cicuta occidentalis** Greene, Pittonia, 2: 7.

Like *C. maculata*, but with elongated fleshy fibrous main roots and duller flowers.

Montana: Bozeman, 1886, *F. Tweedy, 1053;* Helena, 1891, *Kelsey;* Swimming Women Creek, 1882, *Canby.*

Cicuta maculata L. Sp. Pl. 256 [Ill. Fl. **2**: 536; Man. R. M. 116; Bot. Cal. **1**: 260]; *Cicuta virosa* Coulter & Rose, Rev. 130.

In water and in wet meadows, up to an altitude of 2500 m.

Yellowstone Park: Upper Madison Cañon, Aug. 3, 1897, *Rydberg & Bessey, 4611;* Lower Geyser Basin, Aug. 4, *4610.*

Berula erecta (Huds.) Coville, Contr. U. S. Nat. Herb. **4**: 115 [Ill. Fl. **2**: 538]; *Sium erectum* Huds. Fl. Angl. 103; *Sium angustifolium* L. Sp. Pl. Ed. 2, 1872; *Berula angustifolia* Mert. & Koch. Deutchl. Fl. **2**: 433 [Man. R. M. 115; Bot. Cal. **1**: 260; Coulter & Rose, Rev. 133].

In water, up to an altitude of 1500 m.

MONTANA: Bozeman, 1892, *Mrs. Alderson;* Fort Logan, 1882, *Canby*.

* **Sanicula Nevadensis** Wats. Proc. Am. Acad. Sci. **9**: 139 [Bot. Cal. 256; Coulter & Rose, Rev. 105].

Leaves ternate, the divisions ovate, 3–5-lobed; involucre with pinnatifid leaf-like bracts. Open woods.

MONTANA: Jocko and Flat Head Rivers, *Canby, 142*.

* **Sanicula Marylandica** L. Sp. Pl. 235 [Ill. Fl. **2**: 523: Coulter & Rose, Rev. 102].

A plant with palmately 5–7-foliolate leaves, with obovate or oblanceolate serrate segments; fruit bristly with styles longer than the bristles. Meadows, up to an altitude of 1500 m.

MONTANA: Bozeman, 1896, *Flodman, 681:* Belt Mountains, 1886, *F. W. Anderson, 165;* West Boulder, 1887, *Tweedy, 203;* Hound Creek, 1883, *Scribner, 61:* Judith Mountains, 1882, *Canby:* Ross' Hole, 1880, *Watson*.

Ligusticum filicinum Wats. Proc. Am. Acad. Sci. **11**: 140 [Man. R. M. 117: Coulter & Rose, Rev. 87].

At an altitude of about 2500 m.

YELLOWSTONE PARK: Lewis Lake, 1884, *Tweedy, 5*.

* **Ligusticum Canbyi** Coulter & Rose, Rev. N. Am. Umb. 87.

Leaves biternate; leaflets lanceolate, 7.5–10 cm. long, pinnately parted below, then confluent, toothed above; involucels elongated, 1.25 cm. long, linear.

MONTANA: Jocko River, 1883, *Canby, 155*.

Ligusticum scopulorum Gray, Proc. Am. Acad. Sci. **7**: 347 [Man. R. M. 117].

At an altitude of about 2500 m.

YELLOWSTONE PARK: *C. C. Parry, 121*.

Cymopterus terebinthinus (Hook.) Torr. & Gray, Fl. N. Am. **1**: 624 [Man. R. M. 118: Bot. Cal. **1**: 266; Coulter & Rose, Rev. 79]; *Selinum terebinthinum* Hook. Fl. Bor. Am. **1**: 266.

In the mountains, at an altitude of 2500 m.

Montana: Bozeman, 1887, *Tweedy, 213.*

Cymopterus acaulis (Pursh) Rydb. Bot. Surv. Neb. 3: 38 [Ill. Fl. 2: 517]; *Selinum acaule* Pursh, Fl. Am. Sept. 732; *Cymopterus glomeratus* Raf. Journ. Phys. **89**: 100 [Man. R. M. 119; Coulter & Rose, Rev. 76].

Dry prairies, up to an altitude of 1500 m.

Montana: Great Falls, 1886, *F. W. Anderson, 173;* and 1887, *R. S. Williams, 13.*

Cymopterus montanus Torr. & Gray, Fl. N. Am. **1**: 624 [Ill. Fl. 2: 517: Man. R. M. 119; Bot. Cal. **1**: 266; Coulter & Rose, Rev. 78].

Dry prairies, up to an altitude of 3000 m.

Yellowstone Park: *Tweedy*, 1885 (according to Coulter & Rose).

* **Cymopterus glaucus** Nutt. Journ. Phila. Acad. **7**: 28 [Coulter & Rose, Rev. 81].

A species with white flowers, deeply concave seed face and tripinnate leaves, with crowded, linear-oblong segments and revolute margin.

Montana: Jocko River, *Canby, 147.*

CORNACEAE.

Cornus Canadensis L. Sp. Pl. 117 [Ill. Fl. **2**: 543; Man. R. M. 122; Bot. Cal. **1**: 274].

In woods, up to an altitude of 2500 m.

Montana: Little Rocky Mts., 1889, *Dr. V. Havard;* Spanish Basin, 1896, *Flodman, 697;* June 28, 1897, *Rydberg & Bessey, 4636;* Belt Mts., 1891, *R. S. Williams, 217;* Deer Lodge Co., 1892, *Emma Ware;* Lo-Lo Creek, 1880, *Watson.*

Cornus stolonifera Michx. Fl. Bor. Am. **1**: 92 [Ill. Fl. **2**: 545; Man. R. M. 122].

Along streams, up to an altitude of 2000 m.

Montana: Spanish Basin, 1896, *Flodman, 698;* Bridger Mts., June 14, 1897, *Rydberg & Bessey, 4634;* Emigrant Gulch, Aug. 23, *4635;* Deer Lodge Co., *Miss Emma Ware;* Columbia Falls, 1892, *R. S. Williams;* North Box Elder Creek, 1886, *400.*; Snowy Mountains, 1882, *Canby;* Hell Gate, 1880, *Watson.*

PYROLACEAE.

Pyrola chlorantha Sw. Act. Holm. **1810**: 190 [Ill. Fl. **2**: 550; Syn. Fl. **2**^{1}: 47; Man. R. M. 230: Bot. Cal. **1**: 461].

In swamps, up to an altitude of 2500 m.

MONTANA: Bridger Mts., 1896, *Flodman*, *704*; Spanish Basin, *705*; Sheep Creek, *706*; Spanish Basin, June 28, 1897, *Rydberg & Bessey*, *4643*; Jack Creek, July 15, *4642*; Yogo, 1888, *R. S. Williams*, *762*; Gallatin Co., *Mrs. Hodgman*; Ross' Hole, 1880, *Watson*.

YELLOWSTONE PARK: Cache Creek, 1885, *Tweedy*, *918*.

Pyrola uliginosa Torr. Fl. N. Y. **1**: 453 [Ill. Fl. **2**: 551]; *Pyrola rotundifolia uliginosa* A. Gray, Man. Ed. 2, 259 [Syn. Fl. **2**^{1}: 48; Man. R. M. 231].

In cold bogs, up to an altitude of 2800 m.

MONTANA: Bozeman, 1896, *Flodman*, *707*; Jack Creek, July 14, 1897, *Rydberg & Bessey*, *4638*; Indian Creek, July 21, *4639*; Cedar Mountain, July 16, *4640*; Park Co., 1887, *Tweedy*, *96*; Tiger Butte, 1886, *R. S. Williams*, *50*; Bear Creek Cañon, 1892, *W. T. Shaw*; Lewis & Clarke Co., *Mrs. Muth*; White Sulphur Springs, 1883, *Scribner*, *141*; Ross' Hole, 1880, *Watson*.

YELLOWSTONE PARK: Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey*, *4641*; 1884, *Tweedy*, *238*: 1885, *916*.

* **Pyrola asarifolia** Michx. Fl. Bor. Am. **1**: 251 [Ill. Fl. **2**: 551]; *Pyrola rotundifolia asarifolia* Hook. Fl. Bor. Am. **2**: 46 [Syn. Fl. **2**^{1}: 47].

Like the preceding, but with reniform or cordate leaves, and generally somewhat larger flowers. In bogs, up to an altitude of 2000 m.

MONTANA: Little Rocky Mts., 1889, *Dr. V. Havard*.

Pyrola elliptica Nutt. Gen. **1**: 273 [Ill. Fl. **2**: 550; Syn. Fl. **2**^{1}: 47; Man. R. M. 230].

Woods, up to an altitude of 2000 m.; rare.

MONTANA: Highwood Cañon, 1889, *R. S. Williams*, *839*.

Pyrola picta Smith, Rees' Cycl. [Syn. Fl. **2**^{1}: 48; Man. R. M. 231; Bot. Cal. **1**: 460].

Open woods, up to an altitude of 2500 m.

MONTANA: Middle Creek, 1886, *Tweedy*, *1171*; Neihart, 1888, *R. S. Williams*, *763*.

YELLOWSTONE PARK: Sulphur Hills, 1885, *Tweedy*, *914* and *915*; 1873, *C. C. Parry*, *198*.

Pyrola minor L. Sp. Pl. 396 [Ill. Fl. **2**: 552; Syn. Fl. **2**^{1}: 46; Man. R. M. 230].

Damp woods and bogs, up to an altitude of 2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 702;* Indian Creek, July 21, 1897, *Rydberg & Bessey, 4647;* Unionville, 1892, *E. N. Brandegee;* Lewis & Clarke Co., *Mrs. Muth;* Crow Creek, 1883, *Scribner, 140.*

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4648.*

Pyrola secunda L. Sp. Pl. 396 [Ill. Fl. **2**: 552; Syn. Fl. **2**^{1}: 46; Man. R. M. 230; Bot. Cal. **1**: 460].

Wet woods and shaded swamps, up to an altitude of 2500 m.

MONTANA: Little Rocky Mts., 1889, *Dr. V. Havard;* Lima, 1895, *Rydberg, 2745;* Bridger Mts., 1896, *Flodman, 703;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 4644;* Electric Peak, Aug. 18, *4645;* Indian Creek, July 21, *4646;* Gallatin Co., *Mrs. Alderson;* Clendenin, 1882, *R. S. Williams, 187.*

YELLOWSTONE PARK: Yellowstone Lake, 1885, *Tweedy, 917;* 1884, *237;* 1871, *Hayden Survey.*

Moneses uniflora (L.) Gray, Man. 273 [Ill. Fl. **2**: 553; Syn. Fl. **2**^{1}: 46; Man. R. M. 230; Bot. Cal. **1**: 460]; *Pyrola uniflora* L. Sp. Pl. 397.

Moist woods, up to an altitude of 2500 m.

MONTANA: Sheep Creek, 1896, *Flodman, 700;* Bridger Mts., *701;* Sun River, 1887, *R. S. Williams, 639;* Missoula, 1880, *Watson.*

YELLOWSTONE PARK: 1885, *Tweedy, 921;* East Crandall Creek, 1887, *P. Koch, 2;* Yellowstone Lake, 1871, *Hayden Survey.*

* **Chimaphila umbellata** (L.) Nutt. Gen. **1**: 274 [Ill. Fl. **2**: 554; Syn. Fl. **2**^{1}: 45; Bot. Cal. **1**: 459]; *Pyrola umbellata* L. Sp. Pl. 396.

The genus is distinguished from *Pyrola* by its corymbose flowers, more or less leafy stem and opposite or whorled leaves. In dry woods and cañons, up to an altitude of 2500 m.

MONTANA: Spanish Peaks, 1896, *Flodman, 699;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 4651;* East Boulder, 1887, *Tweedy, 97;* Clendenin, 1882, *R. S. Williams, 192;* Silver Bow Co., *Mrs. Moore;* Gallatin Co., *Mrs. Alderson;* Missoula, 1880, *Watson.*

YELLOWSTONE PARK: Gibbon Meadows, 1885, *Tweedy.*

MONOTROPACEAE.

Pterospora Andromedea Nutt. Gen. 1: 269 [Ill. Fl. 2: 554; Syn. Fl. 2¹: 48; Man. R. M. 231; Bot. Cal. 1: 462].

In dry woods, up to an altitude of 2000 m.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey, 4649;* Park Co., 1887, *Tweedy, 94;* White Fish Lake, 1892, *R. S. Williams, 889;* Flathead Lake, 1883, *Canby, 222.*

YELLOWSTONE PARK: Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey, 4650;* 1885, *Tweedy, 923.*

Monotropa uniflora L. Sp. Pl. 387 [Ill. Fl. 2: 555; Syn. Fl. 2¹: 49; Man. R. M. 231; Bot. Cal. 1: 463].

In moist woods, up to an altitude of 1000 m.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 890:* Horse Plains, 1883, *H. B. Ayres, XCCCII.*

Hypopitys Hypopitys (L.) Small, Mem. Torr. Bot. Club, 4: 137 [Ill. Fl. 2: 556]; *Monotropa Hypopitys* L. Sp. Pl. 387 [Syn. Fl. 2¹: 50; Man. R. M. 231; Bot. Cal. 1: 463].

Dry woods, up to an altitude of 2500 m.

MONTANA: Bridger Mts., 1896, *Flodman, 708;* Park Co., 1887, *Tweedy, 93;* Clendenin, 1882, *R. S. Williams, 190:* Belt Creek, 1883, *Scribner, 142.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 196;* 1884, *Tweedy, 233.*

ERICACEAE.

Ledum glandulosum Nutt. Trans. Am. Phil. Soc. (II.) 8: 270 [Syn. Fl. 2¹: 43; Man. R. M. 229: Bot. Cal. 1: 459].

In cold bogs, at an altitude of 2500–3000 m.

MONTANA: Park Co., 1887, *F. Tweedy, 89:* Old Hollowtop, near Pony, July 7, 1897, *Rydberg & Bessey, 4652:* Deer Lodge Co., *Miss Emma Ware;* Granite, 1892, *Kelsey;* Madison Valley, 1871, *Hayden Survey;* Belt Mts., 1883, *Scribner, 139.*

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey 4653;* 1885, *Tweedy, 422:* 1873, *Parry, 194.*

* **Menziesia glabella** Gray, Syn. Fl. N. Am. 2¹: 39.

Shrubs with the aspect of an *Azalea* but with small 4-merous urn-shaped corolla and included stamens. This species has filaments more or less bearded below and long-appendaged seeds; the pedicels are almost naked. Woods, up to an altitude of 2500 m.

MONTANA: Deer Lodge, 1889, *F. W. Traphagen;* Spanish Peaks, 1896, *Flodman, 709;* Sun River, 1887, *R. S. Williams, 679;* Columbia Falls, *Mrs. Kennedy, 43;* Deer Lodge Co., *Miss Emma Ware;* McDonald's Peak, 1883, *Canby, 221;* Upper Marias Pass, *Canby, 221.*

* **Menziesia urceolaris** Salisb. Par. Lond. *pl. 44*, 1806–7; *Menziesia ferruginea* Smith; Pursh, Fl. Am. Sept. 264. 1814 [Syn. Fl. **2**^{1}: 39; Bot. Cal. **1**: 457].

Like the last but with longer corolla, merely apiculate seeds, glabrous filaments and more glandular-bristly pedicels. Up to an altitude of 2500 m.

MONTANA: Granite, 1892, *F. D. Kelsey.*

YELLOWSTONE PARK: 1893, *Addison Brown.*

Azaleastrum.

Branching shrubs with alternate deciduous leaves and axillary 1–3-flowered clusters; flowers rather large; corolla saucer-shaped or rotate-campanulate, regular, 5-cleft: sepals membranous-foliaceous, half the length of the corolla; stamens mostly 10, a little exserted, almost equally spreading; filaments bearded at the base; anthers awnless, attached by their backs to the filament, opening by terminal pores; styles slender and curved; stigma peltate and 5-lobed.

The following species, which has generally been included in *Rhododendron*, is one of those that formed the subgenus *Azaleastrum* of Planchon and Maximowicz. This subgeneric name is taken up. The generic characters may have to be slightly modified when the Asiatic members are included. Our American representative, at least, is so unlike the true *Rhododendra* that it deserves generic rank fully as much as *Rhodora* and *Azalea*. It differs from these in the large sepals, lateral flowers and peltate stigmas; from *Rhododendron* in the deciduous leaves, and from the other two in the form of the corolla.

* **Azaleastrum albiflorum** (Hook.); *Rhododendron albiflorum* Hook. Fl. Bor. Am. **2**: 43.

A species with large white flowers and pale green leaves, growing in woods.

MONTANA: McDonald's Peak, 1883, *Canby, 220.*

Kalmia microphylla (Hook.) Heller, Bull. Torr. Bot. Club, **25**: 581; *Kalmia glauca microphylla* Hook. Fl. Bor. Am. **2**: 41 [Syn. Fl. **2**^{1}: 38; Man. R. M. 229; Bot. Cal. **1**: 457].

I think this deserves specific rank, as the distinctive characters, viz: the small flowers and the small short and broad leaves, are very constant. *K. glauca* is not found in the Rockies. Mountain swamps, at an altitude of 2500–3000 m.

MONTANA: Pony, July 7, 1897, *Rydberg & Bessey, 4654*; East Boulder Plateau, 1887, *Tweedy, 95*; Granite, 1892, *Kelsey*; Deer Lodge, *Emma Ware*: Belt Mts., 1883, *Scribner, 138.*

YELLOWSTONE PARK, 1888, *Dr. Chas. H. Hall*; Lone Creek, 1885, *Tweedy, 924.*

Phyllodoce empetriformis (Smith) Don, Edinb. N. Phil. Journ. **17**: 160; *Menziesia empetriformis* Smith, Trans. Linn. Soc. **10**: 380; *Bryanthus empetriformis* Gray, Proc. Am. Acad. **7**: 377 [Syn. Fl. **2**^{1}: 37; Man. R. M. 229; Bot. Cal. **1**: 456].

On mountain sides, at an altitude of 2500–3500 m.

MONTANA: Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 4655*; Hell Roaring Creek, 1886, *Tweedy, 1167*; East Boulder Plateau, 1887, *90*; Madison Co., *Mrs. Fitch*: Columbia Falls, 1892, *R. S. Williams, 887*; Granite, 1892, *Kelsey*; Lake Plateau, 1897, *P. Koch, 3*; Belt Mts., 1883, *Scribner, 136*; Upper Marias Pass, 1883, *Canby, 219.*

YELLOWSTONE PARK: Upper Falls, 1871, *Hayden Survey*; Stinking Water, 1873, *Parry, 193.*

* **Phyllodoce intermedia** (Hook.); *Menziesia intermedia* Hook. Fl. Bor. Am. **2**: 40; *Bryanthus empetriformis intermedius* Gray, Syn. Fl. **2**^{1}: 37.

This much resembles the preceding, differing in the more elongated paler corolla and the acute sepals: it may be a hybrid between the preceding and *P. glanduliflora*, with which it grows.

MONTANA: Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 4656*; East Boulder, 1887, *Tweedy, 92*; Gallatin Co., *Mrs. Koch.*

* Phyllodoce hybrida.

A divaricate shrub, 2–3 dm. high; leaves linear, obtuse, furrowed on the upper surface, and thickly nerved on the lower, as in the other species: pedicels 6–10, about 1.5 cm. long, densely glandular; sepals ovate, obtuse or slightly acutish, green or slightly tinged with rose: corolla sulphur-yellow, slightly tinged with rose, cylindric-campanulate, scarcely at all contracted at the throat, the lobes rounded and almost erect.

As in *P. intermedia*, the corolla is in form intermediate between those of *P. empetriformis* and *P. glanduliflora*. Both may be hybrids of those two species, as all four were growing together. *P. hybrida* is nearest *P. glanduliflora*, having nearly the same color of the corolla and the calyx, and the same glandular pubescence, but the corolla is not contracted at the throat, and the sepals are obtuse as in *P. empetriformis*.

In subalpine bogs, up to an altitude of 2500 m.

MONTANA: Below Old Hollowtop, Pony Mountains, July 7, 1897, *Rydberg & Bessey, 4657*.

* **Phyllodoce glanduliflora** (Hook.); *Menziesia glanduliflora* Hook. Fl. Bor. Am. **2**: 40; *Bryanthus glanduliflorus* Gray, Proc. Am. Acad. **7**: 377 [Syn. Fl. **2**^{1}: 37].

General habit as in the other species, but corolla elongated-urn-shaped, light yellow; pedicels and acuminate sepals glandular-hirsute. Mountain sides and swamps, at an altitude of 2500–3500 m.

MONTANA: East Boulder, 1887, *F. Tweedy, 91;* Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey, 4658;* Haystack Peak, 1887, *F. Tweedy;* Gallatin Peak, 1886, *1186:* Lake Plateau, 1897, *P. Koch, 26*.

* **Cassiope Mertensiana** (Bong.) Don, Edinb. Phil. Journ. **17**: 157 [DC. Prod. **7**: 610; Syn. Fl. **2**^{1}: 36; Bot. Cal. **1**: 456].

A low *Lycopodium*-like plant with small imbricated 4-ranked carinate glabrous leaves, lateral peduncles, and pinkish bell-shaped corolla. Mountain sides, at an altitude of 2500-3500 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 137;* Old Hollowtop, July 7, 1897, *Rydberg & Bessey, 4659;* Gallatin Peak, 1886, *Tweedy, 1169;* Madison Co., 1892, *Mrs. L. A. Fitch;* Belt Mts., *Scribner, 137*.

Arctostaphylos Uva-Ursi (L.) Spreng. Syst. **2**: 287 [Ill. Fl. **2**: 572; Syn. Fl. **2**^{1}: 27; Man. R. M. 228; Bot. Cal. **1**: 453]; *Arbutus Uva-Ursi* L. Sp. Pl. 395.

In woods, up to an altitude of 2500 m.

MONTANA: Indian Creek, July 21, 1897, *Rydberg & Bessey, 4660;* Lewis & Clarke Co., *Mrs. Muth;* Gallatin Co., *Mrs. Alderson;* Bridger Cañon, 1892, *W. T. Shaw;* Helena, 1892, *F. D. Kelsey;* Mt. Helena, 1883, *Canby, 218*.

YELLOWSTONE PARK: 1886, *Francis Hall*.

Gaultheria humifusa (Graham); *Vaccinium humifusum* Graham, Edinb. N. Phil. Journ. **1831**: 193; *Gaultheria Myrsinites* Hook. Fl. Bor. Am. **2**: 35. 1834 [Syn. Fl. 2^1: 30; Man. R. M. 228; Bot. Cal. **1**: 454].

Wooded hillsides, at an altitude of 2500 m.

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4661;* Broad Creek, 1885, *Tweedy, 925;* 1884, *236;* 1873, *Parry, 195.*

VACCINIACEAE.

* **Vaccinium membranaceum** Dougl.; Hook. Fl. Bor. Am. **2**: 32 [Ill. Fl. **2**: 576]; *Vaccinium myrtilloides* Hook. Fl. Bor. Am. **2**: 32 [Syn. Fl. 2^1: 24]: not Michx. 1803.

A species with oval or oblong-ovate serrulate leaves, green on both sides, and purple-black berries. In woods, up to an altitude of 2000 m.

MONTANA: Spanish Basin, 1896, *Flodman, 711;* Granite, 1892, *Kelsey;* Gallatin Co., *Mrs. Alderson:* Belt Park, 1886, *R. S. Williams, 538* (last two specimens with narrow leaves); Missoula, 1880, *Watson;* Bozeman, 1883, *Canby, 216;* Jocko River, *217*, in part (narrow leaves).

* **Vaccinium ovalifolium** Smith, in Rees' Cycl. No. 2 [Syn. Fl. 2^1: 24; Ill. Fl. **2**: 577; Bot. Cal. **1**: 451].

Like the last but with leaves which are paler beneath. Woods, at an altitude of about 2000 m.

MONTANA: Spanish Basin, 1896, *Flodman, 710.*

* Vaccinium globulare.

A shrub 3–8 dm. high, glabrous throughout except slightly pubescent on the veins; stem and branches round, only the youngest branches slightly angled; bark of stems gray, somewhat shreddy, that of the branches brown or of the youngest yellowish; leaves 1–3 cm. long, very short-petioled, broadly oval or obovate, obtuse or acute, thin, somewhat paler beneath, reticulate, finely serrate: teeth often with a fine hair-like mucro; pedicels 5–10 mm. long; calyx-teeth almost obsolete; corolla depressed-globose, yellowish white; berry purplish, 6–8 mm. in diameter.

This species has been confused with *V. membranaceum* Dougl. or *V. myrtilloides* Hook. and may be included in Hooker's description as it is in Gray's in his Synoptical Flora. There is in the Torrey Herbarium a specimen from Hooker, apparently a cotype of *V. myrtilloides* Hook. This specimen represents a species that has larger leaves, which are more acuminate, more sharply serrate and apparently not paler beneath, has an ovate-globular corolla and a larger almost black berry, which is often 1 cm. in diameter.

V. globulare grows in woods, at an altitude of 1000–2500 m.

MONTANA: Spanish Creek, 1886, *Tweedy, 1170;* Prickly Pear Creek, 1883, *Scribner, 133* (?); Jocko River, 1883, *Canby, 217,* in part.

The following specimens also belong here:

IDAHO: Lake Waha, 1886, *A. A. & E. Gertrude Heller, 3181.*

UTAH: Uintas, 1869, *Watson, 735* (this was referred to *V. Myrtillus* by Dr. Gray).

BRITISH COLUMBIA: Glacier, 1897, *Mrs. Palmer.*

Vaccinium erythrococcum; *Vaccinium Myrtillus microphyllum* Hook. Fl. Bor. Am. **2**: 33, 1834 [Syn. Fl. **2**^{1}: 24; Man. R. M. 228; Bot. Cal. **1**: 450], not Reinw. 1825–6; *V. microphyllum* Rydb. Bull. Torr. Bot.Club, **24**: 253.

Common in woods, up to an altitude of 3000 m.

MONTANA: Park Co., 1887, *F. Tweedy, 87;* Spanish Basin, 1896, *Flodman, 712;* June 28, 1897, *Rydberg & Bessey, 4665;* Pony, *4666;* Park Co., 1887, *Tweedy, 87;* Belt Park, 1886, *R. S. Williams, 492* (large-leaved form); Granite, 1892, *Kelsey;* Odell's 1880, *Watson.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 234;* 1888, *Dr. Chas. H. Hall;* 1883, *Addison Brown;* Upper Falls, Aug. 14, *4664;* Electric Peak, Aug. 18, *4663.*

Vaccinium caespitosum Michx. Fl. Bor. Am. **1**: 234 [Ill. Fl. **2**: 576; Syn. Fl. **2**^{1}: 24; Man. R. M. 228; Bot. Cal. **1**: 450].

Woods, up to an altitude of 2000 m.

MONTANA: Granite, 1892, *Kelsey;* Head of Prickly Pear Cañon, 1883, *Scribner, 134.*

Vaccinium occidentale Gray, Bot. Cal. **1**: 451 [Syn. Fl. **2**^{1}: 23; Man. R. M. 228].

In woods, up to an altitude of about 2500 m.

YELLOWSTONE PARK: Lone Star Geyser, Aug. 7, 1897, *Rydberg & Bessey, 4667;* Gibbon River, 1884, *Tweedy, 235.*

PRIMULACEAE.

Primula farinosa L. Sp. Pl. 143 [Ill. Fl. **2**: 585; Syn. Fl. **2**^{1}: 58; Man. R. M. 233].

In wet meadows, up to an altitude of 2000 m.

MONTANA: Beaver Head River, 1888, *F. Tweedy, 25:* Deer Lodge, 1895, *Rydberg, 2746;* Warm Springs, 1892, *F. D. Kelsey;* Gallatin Co., *Mrs. Alderson:* Smith River, 1883, *Scribner, 143.*

* Primula Parryi brachyantha.

Like the typical *P. Parryi*, but the calyx more campanulate, less tapering into the pedicel, the lobes ovate-lanceolate; tube of corolla short, about 8 mm. long, scarcely exceeding the calyx-lobes; the limb spreading at right angles; leaves broadly oblong-obovate.

This may be distinct from *P. Parryi*, but specimens have been seen from only one locality; in the typical plant the corolla-tube is over 1 cm. long and the leaves are elongated-oblong. It grows at an altitude of 3100 m.

MONTANA: Sheep Mountain, Park Co., 1887, *Tweedy, 82.*

Douglasia montana Gray, Proc. Am. Acad. **7**: 371 [Syn. Fl. **2**^{1}: 60; Man. R. M. 234].

On dry hills and mountains, at an altitude of 2000–3000 m.

MONTANA: *John Pearsall* (Lt. Mullan's Exped.), *908:* Madison Co., 1888, *F. Tweedy, 156:* Deer Lodge, 1888, *F. W. Traphagen;* Helena, 1867, *N. A. Brown* (type): Lima, 1895, *Rydberg, 2748:* Cottonwood Creek, 1896, *Flodman, 716:* Little Belt Mts., *717:* Spanish Peaks, *718:* Spanish Basin, June 24 and 26, 1897, *Rydberg & Bessey, 4683* and *4687;* Pony, July 9, *4686;* Bridger Mts., June 8, *4684* and *4685:* Park Co., 1889, *Tweedy:* Helena, 1892, *Kelsey;* Deer Lodge, 1883, *Tweedy;* Deer Lodge Co., *Miss F. Hobson; W. T. Shaw;* Belt Mts., 1883, *Scribner;* Bozeman Pass, 1883, *Scribner, 146; Canby, 225;* Little Blackfoot, *225;* Upper Marias Pass, *223;* Belt Mountains, 1882, *Canby;* Odell's, 1880, *Watson.*

YELLOWSTONE PARK: Mt. Holmes, 1884, *Tweedy, 245.*

* **Douglasia biflora** A. Nelson, Bull. Torr. Bot. Club, **25**: 277.

Resembling somewhat *D. montana*, but less tufted, and the peduncles longer and generally 2-flowered.

MONTANA: Madison Co., 1888, *Tweedy, 156*, in part.

* **Douglasia nivalis** Lindl.: Brande, Journ. Sc. **1827**: 383.

Like the two preceding, but with flowers in umbels and the whole plant puberulent.

MONTANA: Deer Lodge, 1883, *T. S. Brandegee*, *954*, in part.

Androsace Chamaejasne Willd. Sp. Pl. **1**: 799 [Syn. Fl. **2**^{1}: 60; Man. R. M. 234].

Alpine regions, at an altitude of about 3000 m.

MONTANA: Park Co., 1887, *F. Tweedy*, *80*.

Androsace occidentalis Pursh, Fl. Am. Sept. 137 [Ill. Fl. **2**: 586; Syn. Fl. **2**^{1}: 60; Man. R. M. 234].

In dry soil, up to an altitude of 2000 m.

MONTANA: Gallatin Co., 1888, *F. Tweedy*, *157;* Missoula, 1883, *F. Tweedy*, *827;* Spanish Basin, June 23, 1897, *Rydberg & Bessey*, *4682;* Bozeman, 1892, *W. T. Shaw;* Custer Co., 1892, *Mrs. Light*.

* **Androsace diffusa** Small, Bull. Torr. Bot. Club, **25**: 318.

Like *A. septentrionalis* but with very long and divergent pedicels. In the true *A. septentrionalis* the pedicels are merely ascending and not very long. In wet places in the mountain regions, at an altitude of 2000–3000 m.

MONTANA: Mill Creek, 1887, *F. Tweedy*, *79;* Spanish Peaks, 1896, *Flodman*, *715;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey*, *4679;* Sun River, 1887, *R. S. Williams*, *723;* Lewis & Clarke Co., *Mrs. Muth;* Gallatin Co., *Mrs. Alderson*.

YELLOWSTONE PARK: 1884, *F. Tweedy*, *40;* Boulder Peak, 1883, *Scribner*, *144*.

* **Androsace subumbellata** (A. Nelson) Small, Bull. Torr. Bot. Club, **25**: 319; *Androsace septentrionalis subumbellata* A. Nelson, Bull. Wyo. Exp. Sta. **28**: 149.

Like *A. septentrionalis*, but the umbels nearly sessile in the clusters of the basal leaves and the calyx-lobes broader. In mountain regions, at an altitude of 2000–3500 m.

MONTANA: Indian Creek, July 22, 1897, *Rydberg & Bessey*, *4681;* Pony Mts., July 9, *4680;* Grafton, 1892, *R. S. Williams*, *279;* Bozeman, 1892, *W. T. Shaw;* Lake Plateau, 1897, *P. Koch*, *60*.

YELLOWSTONE PARK: 1884, *F. Tweedy*, *38;* Hoodoo Peak, 1897, *P. Koch*, *9*.

Androsace filiformis Retz. Obs. 2: 10 [Syn. Fl. 2¹: 60; Man. R. M. 234; Bot. Cal. 1: 468].

In wet places, at an altitude of 2000–2500 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 158;* Melrose, 1895, *Rydberg, 2747:* Spanish Basin, 1896, *Flodman, 713* and *714;* Spanish Basin, June 28 to July 1, 1897, *Rydberg & Bessey, 4676* and *4677:* Park Co., 1889, *Tweedy:* Yogo, 1888, *R. S. Williams:* Jefferson City, 1883, *Scribner, 145:* Bozeman Pass, 1883, *Canby, 223;* Big Hole Valley, 1880, *Watson.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 51;* Antelope Creek, 1885, *433;* Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey, 4678:* 1873, *Parry, 200.*

* **Dodecatheon viviparum** Greene, Erythea, 3: 38.

Stout, from a fleshy rootstock: leaves large, more or less dentate with distant small callous teeth. In wet places.

MONTANA: Granite, 1892, *F. D. Kelsey;* Rock Creek, Beaver Head Co., 1888, *Tweedy, 23;* Bozeman, 1882, *Tweedy:* Deer Lodge Co., *Emma Ware* (large-flowered and with large veiny leaves).

* **Dodecatheon conjugens** Greene, Erythea, 3: 40.

Resembling *D. pauciflorum* in habit, but the flowers larger, the anthers distinct and with a rugulose connective ending in a linear tip.

MONTANA: Helena, *Kelsey* (according to Greene, type): Helena, 1888 and 1892, *Kelsey;* Gallatin Co., *Miss Cary Shipman* (one-flowered): Bozeman Pass, 1883, *Scribner, 148.*

* Dodecatheon acuminatum.

Scape 10–15 cm. high, from a cluster of fibrous somewhat fleshy roots: leaves oblong-elliptic, 5–6 cm. long, tapering into a short petiole, generally obtuse, entire-margined, rather fleshy, puberulent; umbel 3–5-flowered; bracts lanceolate, membranous and scarious: calyx tapering gradually into the pedicel; sepals lanceolate: corolla whitish, tinged with purple or rose; corolla-lobes lanceolate, 12–15 mm. long, acuminate; stamens almost free; united filaments scarcely 1 mm. long: anthers 6–7 mm. long; connective purple, broad and rugulose at the base.

This has the leaves of *D. cylindrocarpum* described below and the calyx of *C. Cusickii*, but differs from both species in the form of the stamens, which suggest *D. conjugens.*

MONTANA: Missouri River above mouth of Sand Coulee, 1885, *F. W. Anderson* (type in the Herbarium of Columbia University).

* Dodecatheon pulchrum.

Scape stout, about 2 dm. high, from a cluster of fleshy root-fibers; leaves obovate-elliptic, 7–8 cm. long, without distinct petiole, rather thin, slightly wavy, acute or obtuse, glabrous; umbel 5–7-flowered; bracts lanceolate; corolla rose or purplish, with a wavy deep purple line in the throat; lobes about 2 cm. long, broadly oblong; stamens almost free; filament obsolete; anthers 6–7 mm. long, obtuse; connective purple, lanceolate, rugulose at the base.

It agrees with the description of *D. conjugens*, except that the petioles of the leaves are obsolete. It grows at an altitude of about 2500 m.

Yellowstone Park: Indian Creek, 1885, *F. Tweedy*, *432*, in part.

Dodecatheon pauciflorum (Durand) Greene, Pittonia, **2**: 72; *Dodecatheon Meadia pauciflorum* Durand, Pl. Pratt. 95; *D. Meadia* Coulter, Man. R. M. 233, in part; not L.

Common in rich soil throughout the mountain region, at an altitude of 2000–3000 m.

Montana: Dillon, 1895, *Rydberg*, *2749;* Little Belt Mts., 1896, *Flodman*, *720*, *721* and *722;* Deer Lodge, 1888, *F. W. Traphagen;* Hell Roaring Creek, Park Co., 1887, *Tweedy*, *81;* Old Hollowtop, Pony, July 9, 1897, *Rydberg & Bessey*, *4670;* July 7, *4671;* Spanish Basin, July 1, *4672;* Indian Creek, 1885, *Tweedy*, *432*, in part; Granite, 1892, *Kelsey;* Twin Bridges, *H. M. Fitch;* Belt Mts., 1888, *R. S. Williams*, *780*.

Yellowstone Park: 1888, *Dr. Chas. H. Hall.*

* **Dodecatheon Cusickii** Greene, Pittonia, **2**: 73.

Resembling *D. pauciflorum*, but the calyx gradually tapering into the pedicels. At an altitude of 2500 m.

Montana: Helena, 1892, *Kelsey*.

* **Dodecatheon puberulentum** Heller, Bull. Torr. Bot. Club, **24**: 311.

Nearest related to the preceding, but characterized by the column of the filaments, which is very narrow and fully half as long as the diverging anthers. Hillsides and mountains, at an altitude of 300–2500 m.

Yellowstone Park: 1888, *Dr. Chas. H. Hall;* 1883, *Miss Mary Compton.*

* Dodecatheon cylindrocarpum.

Scape rather stout, 1–2 dm. high, from a cluster of fibrous roots, which in age become somewhat thickened and fleshy: leaves 5–10 cm. long, oblong-oblanceolate, gradually tapering into a winged petiole, mostly obtuse, fleshy, with a strong midrib, glabrous and shining; umbel 4–7-flowered: bracts lanceolate, 5–8 mm. long; calyx-lobes lanceolate, about 5 mm. long; united part of the corolla yellow, the free lobes bluish purple, oblong or lanceolate, obtuse or acute, 12–15 mm. long; united filaments very short, scarcely more than 1 mm. long; anthers linear-oblong, 6–7 mm. long, acute; connective lanceolate-acuminate, its dark purple coloration reaching the tip of the anthers; capsules on erect pedicels, cylindric, 15–20 mm. or more long and 5 mm. in diameter, in opening its top breaking off as a lid, the body later splitting into 5 valves.

It somewhat resembles *D. pauciflorum*, but the leaves are broader and thicker, the filaments are much shorter and the coloration of the flower is somewhat different. In *D. pauciflorum* the united filaments are at least 3 mm. long, while the anthers are seldom more than 4 mm. The yellow throat of the corolla of that species is nearly always marked by a dark purple wavy line. It may be close to *D. conjugens* Greene, of which I have not seen authentic specimens, but the stamens are not perfectly free, as described in that species, the connective is as a rule not crenulate, and the anthers are not obtuse.

It grows in rich soil in the valleys of the mountain regions, at an altitude of 1500–2500 m.

MONTANA: Missouri River, above mouth of Sand Coulee, 1885, *F. W. Anderson* (in flower); Bridger Mountains, June 17, 1897, *Rydberg & Bessey, 4674* and *4675* (in fruit); Great Falls, 1888, *R. S. Williams, 781* (in flower).

YELLOWSTONE PARK: Indian Creek, 1885, *Tweedy, 432*, in part.

WASHINGTON: Snognalme Pass, Cascade Mts., 1882, *Tweedy*.

* Dodecatheon pubescens.

Scape slender, about 1 dm. high, from a cluster of fibrous roots; leaves 2–3 cm. long, elliptic or broadly spatulate, obtuse, abruptly contracted into a distinct slightly winged petiole, densely and finely pubescent; umbel 2–5-flowered; bracts lanceolate, less than 5 mm. long; sepals lanceolate, acute; corolla bluish purple, its lobes linear-oblong, acutish, about 7 mm. long: united portion of the stamens scarcely any, less than 0.5 mm. long; anthers about 5 mm. long, acute; fruit unknown.

It somewhat resembles *D. puberulentum* in the size of the flower and plant, but the leaves are broader and densely pubescent, and the stamens are quite different. In that species the united filaments are of about the same length as the anthers.

MONTANA: Missoula, 1883, *Tweedy*.

* Dodecatheon uniflorum.

Scape seldom over 5 cm. high (in one specimen 10 cm.), puberulent, 1-flowered (in one specimen 3-flowered), from a short rootstock and a cluster of fibrous roots; leaves spatulate or oblanceolate, obtuse, nearly without a petiole, densely puberulent; bracts short, ovate or lanceolate, about 2 mm. long; calyx-lobes linear-lanceolate, 2–3 mm. long: united part of the corolla yellow, with or without a dark purple wavy line; lobes dark bluish purple, oblong, about 1 cm. long; united filaments fully 2 mm. long, orange; anthers 3 mm. long, dark purplish blue on the back and with yellow sides; the connective triangular-lanceolate, acuminate; capsule cylindric, 6–10 mm. long and 4 mm. in diameter, splitting into 5 valves.

Differs from *D. pubescens* in the less distinct petiole, but especially in the form of the stamens. In the color of the flower and the form of the stamens it is strikingly like *D. pauciflorum*, and may be mistaken for a depauperate form of it, but in that species the leaves are always glabrous, much longer, and with a distinct petiole. It grows on the sides of the higher mountains, at an altitude of 2500–3000 m., sometimes with *D. pauciflorum*.

MONTANA: Old Hollowtop, near Pony, July 7 and 9, 1897, *Rydberg & Bessey*, *4668* and *4669;* Spanish Basin, June 24, *4673;* Rock Creek, 1888, *Tweedy*, *24*†; Belt Mountains, 1883, *Scribner*, *147*.†

Steironema ciliatum (L.) Raf. Ann. Gen. Phys. **7**: 192 [Ill. Fl. **2**: 589; Syn. Fl. **2**^{1}: 61; Man. R. M. 235]; *Lysimachia ciliata* L. Sp. Pl. 147.

In or near water, up to an altitude of 1800 m.

MONTANA: Bozeman, 1886, *F. Tweedy;* 1896, *Flodman*, *719;* Great Falls, 1890, *R. S. Williams*, *216;* Deer Lodge Co., *Emma Ware;* West Gallatin, *W. T. Shaw;* Fort Ellis to Yellowstone, 1871, *Hayden Survey;* Sixteen Mile Creek, 1883, *Scribner*, *149;* Bitter Root Valley, 1880, *Watson*.

* **Naumburgia thyrsiflora** (L.) Duby, in DC. Prod. **8**: 60 [Ill. Fl. **2**: 591]; *Lysimachia thyrsiflora* L. Sp. Pl. 147 [Syn. Fl. **2**^{1}: 63].

A species with narrowly linear-lanceolate leaves and small yellow flowers in dense heads or oblong spikes from the axils of the lower leaves. In water, up to an altitude of 1000 m.

MONTANA: Columbia Falls, *Mrs. Kennedy*, *42*.

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† These specimens are more glabrous.

Glaux maritima L. Sp. Pl. 207 [Ill. Fl. **2**: 592; Syn. Fl. **2**^{1}: 63; Man. R. M. 235; Bot. Cal. **1**: 469].

In salt marshes and subsaline soil, up to an altitude of 2500 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 159;* Deer Lodge, 1895, *Rydberg, 2750;* Helena, 1891, *Kelsey;* Madison Co., *Mrs. L. A. Fitch;* Jefferson River, 1883, *Scribner, 150.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Mammoth Hot Springs, 1884, *F. Tweedy.*

Centunculus minimus L. Sp. Pl. 116 [Ill. Fl. **2**: 593; Syn. Fl. **2**^{1}: 64; Man. R. M. 235; Bot. Cal. **1**: 469].

In moist soil, up to an altitude of 1000 m.

MONTANA: Great Falls, 1891, *R. S. Williams, 693;* Bitter Root Valley, 1880, *Watson.*

GENTIANACEAE.

* **Gentiana elegans** A. Nelson, Bull. Torr. Bot. Club, **24**: 276.

Nearest related to *G. detonsa*, but differs in the broader obtuse leaves and the calyx-lobes which are not very unequal in length, although two of them are much broader. In wet places, at an altitude of 2000–2500 m.

MONTANA: Beaver Head Co., *Mrs. Laura Scott;* Head of Stillwater, 1897, *P. Koch, 64;* Indian Creek, July, 1897, *Rydberg & Bessey, 4696.*

YELLOWSTONE PARK: 1896, *J. F. Kemp;* 1883, *Dr. J. S. Newberry;* 1884, *Tweedy, 209;* 1885, *Tweedy;* 1883, *Miss Mary Compton;* Mud Springs, 1882, *J. M. Coulter;* 1888, *Dr. Chas. H. Hall;* Upper Yellowstone, 1871, *Hayden Survey.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 4695.*

* **Gentiana elegans unicaulis** A. Nelson, Bull. Torr. Bot. Club, **24**: 277.

Smaller and with a simple stem, 3–5 pairs of leaves, and smaller flowers.

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4894.*

Gentiana detonsa Rottb. Act. Hafn. **10**: 254 [Ill. Fl. **2**: 614]; *Gentiana serrata* Gunner, Fl. Norv. 10 [Syn. Fl. **2**^{1}: 117; Man. R. M. 243].

The specimens from Montana have narrower corolla-lobes, and the narrower pair of calyx-segments are less elongated.

MONTANA: Teton River, 1883, *Scribner, 154.*

Gentiana heterosepala Engelm. Trans. Acad. St. Louis, **2**: 215 [Syn. Fl. 2^1: 118; Man. R. M. 244].

In mountain meadows, at an altitude of 2000–2500 m.

MONTANA: Lima, 1895, *Rydberg*, *2751*; Head of Stillwater, 1897, *P. Koch*, *70*.

YELLOWSTONE PARK; Lone Star Geyser, Aug. 7, 1897, *Rydberg & Bessey*, *4693*; East De Lacy's Creek, Aug. 10, *4692*; Upper Falls, Aug. 4, *4691*.

Gentiana acuta Michx. Fl. Bor. Am. **1**: 177 [Ill. Fl. **2**: 614]; *Gentiana Amarella acuta* Herder, Act. Hort. Petrop. **1**: 428 [Syn. Fl. 2^1: 118; Man. R. M. 244; Bot. Cal. **1**: 481].

Hillsides and valleys, at an altitude of 1500–2500 m.

MONTANA: Lima, 1895, *Rydberg*, *2752*; Sheep Creek, 1896, *Flodman*, *723*; Little Belt Mts., *724*; East Boulder, 1887, *F. Tweedy*, *83*; Belt Creek, 1886, *R. S. Williams*, *316*; Silver Bow Co., *Mrs. Ida B. Christie*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1894, *F. H. Burglehaus*; 1884, *F. Tweedy*, *210*.

Gentiana acuta strictiflora; *Gentiana acuta stricta* Griseb.; Hook. Fl. Bor. Am. **2**: 63, 1834; not *G. stricta* Willd. 1820. *G. Amarella stricta* Wats. King's Rep. **5**: 278 [Syn. Fl. 2^1: 118; Man. R. M. 244]; *G. arctophila densiflora* Torr. Frem. Rep. 94, 1845; not Griseb., 1834.

MONTANA: Lima, 1895, *Rydberg*, *2753*; Little Belt Mts., 1896, *Flodman*, *725*; Martindale, 1882, *Tweedy*.

YELLOWSTONE PARK: 1884, *F. Tweedy*, *208*.

Gentiana frigida Haenke, Jacq. Coll. **2**: 13 [Syn. Fl. 2^1: 120; Man. R. M. 245].

Mountain tops, at an altitude of 3000 m.

MONTANA: Gallatin Peak, 1886, *F. Tweedy*, *1197*; Mill Creek, 1887, *84*.

* **Gentiana calycosa monticola** Rydb. Bull. Torr. Bot. Club, **24**: 252; *Gentiana calycosa stricta* Griseb. Gen. & Spec. Gent. 292 [Syn. Fl. 2^1: 121]; not Willd., nor Klotsch.

Lower than the typical *G. calycosa*, 5–10 cm. high, and the leaves small, short and broad. High mountain tops, at an altitude of 2500–3500 m.

MONTANA: Yogo Baldy, Little Belt Mts., 1896, *Flodman*, *726*; Belt Cañon, 1885, *R. S. Williams*, *652*; McDonald's Peak and Upper Marias Pass, 1883, *Canby*, *228*.

* **Gentiana Oregana** Engelm.; Gray, Syn. Fl. 2¹: 122; *Gentiana affinis ovata* Gray, Bot. Cal. 1: 483.

Like *G. affinis* Griseb., but with broader ovate leaves and broadly funnel-form corolla. In valleys, up to an altitude of 1500–2000 m.

MONTANA: Lima, 1895, *Rydberg, 2756;* Livingston, 1892, *F. D. Kelsey;* Middle Creek Cañon, 1891, *W. T. Shaw;* Ennis, 1886, *Tweedy, 1198;* Meadow Creek, 1886, *1199;* Silver Bow Co., *Mrs. Moore;* Ribby, 1883, *Scribner, 155;* Madison Co., 1886, *Tweedy, 1199* (narrower leaves than usual).

Gentiana Forwoodii Gray, Proc. Am. Acad. 19: 86 [Syn. Fl. 2¹: 406; Man. R. M. 236].

On hillsides, up to an altitude of 2800 m.

MONTANA: Little Rocky Mts., 1889, *Dr. V. Havard;* Mullan Tunnel, 1890, *F. D. Kelsey;* Cliff Lake, July 27, 1897, *Rydberg & Bessey, 4689;* Lima, 1895, *Rydberg, 2754;* Bozeman, *2755;* Judith Basin, 1896, *Flodman, 727;* Sweet Grass Cañon, *728;* Belt Cañon, 1886, *R. S. Williams, 189;* Blackfoot River, 1883, *Canby, 229;* Belt Mts., 1882, *Canby.*

YELLOWSTONE PARK: 1885, *G. W. Letterman;* Yellowstone Lake, 1871, *Hayden Survey;* Yellowstone Falls, Aug. 14, 1897, *Rydberg & Bessey, 4690;* Yellowstone Lake, Aug. 12, *4688;* Mammoth Hot Springs, 1884, *F. Tweedy, 211;* Crandall Creek, 1897, *P. Koch, 63;* Upper Falls, 1871, *Hayden Survey.*

Frasera speciosa Dougl. Fl. Bor. Am. 2: 266 [Syn. Fl. 2¹: 125; Man. R. M. 246; Bot. Cal. 1: 484].

Dry hillsides, at an altitude of 1500–3000 m.

MONTANA: Lima, 1895, *Rydberg, 2757;* Judith Basin, 1897, *Flodman, 729;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4700;* Haystack Peak, Park Co., 1887, *F. Tweedy, 86;* Beaver Head Co., 1888, *129;* Upper Sand Coulee, 1889, *R. S. Williams, 33;* Prickly Pear Cañon, 1883, *Scribner, 156.*

YELLOWSTONE PARK: 1884, *F. Tweedy;* 1885, *784.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4698.*

* **Frasera albicaulis** Dougl.; Griseb. in Hook. Fl. Bor. Am. 2: 67 [Syn. Fl. 2¹: 126].

A minutely pruinose plant with narrow leaves, interrupted thyrsoid inflorescence and lavender-blue flowers.

MONTANA: Big Hole Valley, 1880, *Watson.*

Swertia perennis L. Sp. Pl. 226 [Syn. Fl. **2**^{1}: 124; Man. R. M. 246].

Among bushes, at an altitnde of 2000–3000 m.

MONTANA: Gallatin Peak, 1886, *F. Tweedy, 1196;* East Boulder, 1887, *85;* Melrose, 1895, *Rydberg, 2757*; Jack Creek, July 15, 1897, *Rydberg & Bessey, 4699;* Deer Lodge, *Prof. Notestein;* Silver Bow Co., *Mrs. Moore;* Lake Abundance, 1897, *P. Koch, 77.*

YELLOWSTONE PARK: Falls, 1873, *C. C. Parry, 244.*

APOCYNACEAE.

Apocynum androsaemifolium L. Sp. Pl. 213 [Ill. Fl. **3**: 2; Syn. Fl. **2**^{1}: 82; Man. R. M. 237: Bot. Cal. **1**: 473].

Hillsides and valleys, up to an altitude of 2000 m.

MONTANA: Bozeman, 1887, *Mrs. Alderson;* Deer Lodge, 1889, *F. W. Traphagen;* Bozeman, 1887, *F. Tweedy;* Gate of the Mountains, 1892, *Kelsey;* Great Falls, *F. W. Anderson;* Box Elder Creek, 1886, *R. S. Williams, 372;* Spanish Basin, July 23 and 24, 1897, *Rydberg & Bessey, 4701;* Bridger Mts., June 18, *4702;* Silver Bow Co., *Mrs. Moore;* Townsend, 1883, *Scribner.*

* **Apocynum cannabinum glaberrimum** DC. Prod. **8**: 439 [Ill. Fl. **3**: 3].

Leaves smaller than in the type, oblong-lanceolate, acute at both ends. Up to an altitude of 1500 m.

MONTANA: Great Falls, 1886, *R. S. Williams, 373;* Gate of the Mountains, 1892, *F. D. Kelsey;* Sixteen Mile Creek, 1883, *Scribner, 151.*

ASCLEPIADACEAE.

Asclepias speciosa Torr. Ann. Lyc. N. Y. **2**: 218 [Syn. Fl. **2**^{1}: 91; Ill. Fl. **3**: 10; Man. R. M. 239; Bot. Cal. **1**: 474].

In moist rich soil, up to an altitude of 2000 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 125;* Helena, 1892, *F. D. Kelsey;* Custer Co., 1892, *Mrs. Light;* Jocko Indian Agency, 1883, *Canby, 227;* Ravalli, 1883, *H. B. Ayres, CCCXXVI;* Bitter Root Valley, 1880, *Watson.*

Asclepias pumila (Gray) Vail; Britton & Brown, Ill. Fl. **3**: 12; *Asclepias verticillata pumila* Gray, Proc. Am. Acad. **12**: 71 [Syn. Fl. **2**^{1}: 97; Man. R. M. 241].

Dry prairies and plains, up to an altitude of 1500 m.

MONTANA: Yellowstone, 1885, *Hayden Survey.*

Acerates viridiflora (Raf.) Eat. Man. Ed. 5, 90 [Ill. Fl. **3**: 14; Syn. Fl. **2**^{1}: 99; Man. R. M. 242].

Plains and prairies, up to an altitude of 1000 m.

MONTANA: Lower Falls of Missouri, 1888, *R. S. Williams*, *272;* Bull Mountain, 1882, *Canby*.

CONVOLVULACEAE.

Convolvulus Sepium L. Sp. Pl. 153 [Ill. Fl. **3**: 25; Syn. Fl. **2**^{1}: 215; Man. R. M. 265].

Among bushes, up to an altitude of 1500 m.

MONTANA: East Gallatin Swamps, 1895, *Flodman*, *730;* Helena, 1890, *F. D. Kelsey;* Missoula Co., *Mrs. J. J. Kennedy;* Smith River, 1883, *Scribner*, *180;* Missoula, 1880, *Watson*.

* **Convolvulus arvensis** L. Sp. Pl. 153 [Ill. Fl. **3**: 26; Syn. Fl. **2**^{1}: 216].

Smaller than the preceding, with the small lanceolate bracts near the middle of the peduncle. Introduced into old fields and waste places.

MONTANA; Manhattan, 1895, *Rydberg*, *2759:* Helena, 1891, *F. D. Kelsey*.

CUSCUTACEAE.

Cuscuta Gronovii Willd.: R. & S. Syst. **6**: 205 [Ill. Fl. **3**: 30: Syn. Fl. **2**^{1}: 221; Man. R. M. 267].

On coarse herbs and low shrubs, up to an altitude of 1500 m.

MONTANA: Livingston, 1892, *F. D. Kelsey:* Dry Creek, 1883, *Scribner*, *187* (var. *curta* Engelm.).

Cuscuta arvensis Beyrich: Hook. Fl. Bor. Am. **2**: 77 [Ill. Fl. **3**: 28; Syn. Fl. **2**^{1}: 220; Man. R. M. 226; Bot. Cal. **1**: 535].

On various herbs, up to an altitude of 1500 m.

MONTANA: Sand Coulee, 1887, *R. S. Williams*.

POLEMONIACEAE.

Phlox muscoides Nutt. Journ. Acad. Phila. **7**: 42 [Syn. Fl. **2**^{1}: 132; Man. R. M. 247; E. Nelson. Rev. †].

Dry hills, up to an altitude of perhaps 2500 m.

MONTANA: Sources of the Missouri, *Wyeth;* Deer Lodge, 1888, *F. W. Traphagen;* Gallatin Co., 1888, *F. Tweedy*, *28;* Helena,

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† Elias Nelson, Revision of the Western North American Phloxes.

F. D. Kelsey; Beaver Head Co., 1888, *Tweedy, 26;* Melrose, 1895, *Rydberg, 2760* and *2761;* Butte, 1896, *J. F. Kemp;* Deer Lodge, 1892, *W. T. Shaw;* Bozeman, 1892, *Shaw.*

Phlox canescens Torr. & Gray, Pac. R. R. Rep. **2**: 8 [Syn. Fl. **2**¹: 132; Man. R. M. 248; Bot. Cal. **1**: 487; E. Nelson, Rev. 10].

Dry hills, up to an altitude of 2800 m.

MONTANA: Big Blackfoot River, *John Pearsall* (Mullan Expedition); Beaver Head Co., 1888, *F. Tweedy, 27.*

YELLOWSTONE PARK: Swan Lake, 1885, *F. Tweedy, 826.*

Phlox Hoodii Richards.; Frankl. Journ. App. 733 [Syn. Fl. **2**¹: 132; Ill. Fl. **3**: 37; Man. R. M. 247; E. Nelson, Rev. 10].

Dry hills and plains, up to an altitude of 2000 m.

MONTANA: Bridger Mts., June 11, 1897, *Rydberg & Bessey, 4810a* and *4817;* Missoula Co., *Mrs. Kennedy;* Bozeman Pass, 1883, *Scribner, 156bis;* Great Falls, 1892, *R. S. Williams, 831.*

Phlox caespitosa Nutt. Journ. Acad. Phil. **7**: 41 [Syn. Fl. **2**¹: 132; Man. R. M. 248; Bot. Cal. **1**: 487; E. Nelson, Rev. 14].

Dry hills, up to an altitude of 3000 m.

MONTANA: Flathead River, *Wyeth;* Hell Gate, *John Pearsall,* (Mullan Expedition); Spanish Peaks, 1896, *Flodman, 731;* Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey, 4813* and *4815;* Spanish Basin, June 26, *4814;* Indian Creek, July 22, *4812;* Missoula, 1883, *Tweedy;* Wisconsin Creek, 1892, *J. B. Allebaugh;* Lewis and Clarke Co., *Mrs. F. Harwood.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 284,* in part.

* Phlox scleranthifolia.

Cespitose, with comparatively long depressed branches, perfectly glabrous or finely puberulent, except a few villous hairs at the base of the leaves and on the calyx; leaves with a clasping somewhat scarious base, very narrow, about 1 cm. long, and less than 0.5 mm. wide, spinose-tipped, somewhat diverging, with prominent midvein and recurved margin; flowers sessile or nearly so; calyx about 5 mm. long, its teeth lanceolate, bristle-tipped; corolla white, its tube slightly exceeding the calyx; lobes of the limb narrow, 6–8 mm. long.

In habit it most resembles *P. diffusa,* but the leaves are much finer, scarcely more than one-fourth as wide, and the corolla-tube is much shorter. On wooded hillsides, at an altitude of 1000–2000 m.

SOUTH DAKOTA: Hot Springs, Black Hills, 1892, *Rydberg, 880* (type).

MONTANA: Spanish Peak, 1896, *Flodman, 732;* Deer Lodge Co., *Emma Ware* (?). The latter specimen is glandular and may belong to a distinct species.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4809.*

Phlox Douglasii Hook. Fl. Bor. Am. **2**: 73 [Ill. Fl. **3**: 37; Syn. Fl. **2**^{1}: 132: Man. R. M. 248; Bot. Cal. **1**: 486]; *P. andicola* E. Nelson, Rev. 13; not Nutt.

Mr. Elias Nelson, whose excellent revision is before me, has apparently confused *P. Douglasii* and *P. andicola.* A co-type of the former is in the Torrey Herbarium and it has the thick root and caudex and erect branches found in *A. Nelson, no. 397,* cited by Mr. Nelson under *P. andicola. P. andicola* Nutt. is a different plant. The type of the latter is in the Torrey herbarium. It has the spreading cespitose habit of *P. multiflora* A. Nelson, but has stiffer more pungent leaves. *P. Douglasii,* as understood by E. Nelson, is probably an undescribed species.

In valleys and on prairies, up to an altitude of 2500 m.

MONTANA: Belt River, 1881, *R. S. Williams, 117;* Deer Lodge, *Emma Ware;* Silver Bow Co., *Mrs. Helen Dolman;* Mill Creek, 1887, *Tweedy, 283.*

YELLOWSTONE PARK: 1884, *F. Tweedy,* 1883, *284,* in part.

Phlox andicola Nutt.; Gray, Proc. Am. Acad. **8**: 254, as a synonym; *Phlox Douglasii longifolia* Gray, l. c. [Man. R. M. 248; Syn. Fl. **2**^{1}: 133]; *P. Hoodii* Torr. Ann. Lyc. N. Y. **2**: 220; *P. Douglasii andicola* Britton, Mem. Torr. Bot. Club, **5**: 269 [Ill. Fl. **3**: 377].

In valleys, at an altitude of 1500–2500 m.

MONTANA: Deer Lodge, *F. D. Kelsey.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* 1884, *Tweedy, 285;* Swan Lake and Mammoth Hot Springs, 1885, *828;* 1883, *Miss Mary Compton.*

Phlox longifolia Nutt. Journ. Acad. Phila. **7**: 41 [Syn. Fl. **2**^{1}: 133; Man. R. M. 248; Bot. Cal. **1**: 486].

In valleys, up to an altitude of 2500 m.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Gallatin Co., 1888, *F. Tweedy, 153; Wyeth;* Spanish Basin, 1896, *Flodman, 736;* Little Belt Mountains, *737;* Indian Creek, July 21, 1897, *Rydberg & Bessey, 4805;* Bridger Mountains, June 11–14, *4802, 4803* and *4804;* Pony, July 6, *4801;* Anaconda, 1891, *S. O. Merritt;*

Bozeman, 1892, *W. T. Shaw;* Bozeman, 1883, *Scribner, 158;* Virginia City, 1871, *Hayden Survey;* Odell's, 1880, *Watson.*

YELLOWSTONE PARK: *Dr. Chas. H. Hall,* 1888; Mammoth Hot Springs, 1885, *F. Tweedy, 827.*

* **Phlox multiflora** A. Nelson, Bull. Torr. Bot. Club, **25**: 278 [E. Nelson, Rev. 20].

Resembles somewhat *P. andicola* in leaf and habit, but is characterized by large flowers resembling those of *P. longifolia*, the scarcity of fascicled leaves and the nearly total absence of pubescence, except on the peduncle and calyx which are somewhat puberulent. It grows on hills, at an altitude of 2000–3000 m.

MONTANA: Spanish Basin, 1896, *Flodman;* Lake Plateau, 1897, *Peter Koch;* Beaverhead Co., 1888, *Tweedy, 152;* Spanish Basin, 1897, *Rydberg & Bessey, 4810;* Mt. Chauvet, *4806.*

* **Phlox multiflora depressa** E. Nelson, Rev. W. N. Am. Phloxes, 20.

Depressed-cespitose, with shorter leaves 1 cm. long, and smaller subsessile flowers with the lobes 6–7 mm. long.

MONTANA and IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4808.*

* Phlox costata.

Diffusely cespitose; more or less villous on the peduncles, calyx and upper part of the stem; leaves about 1 cm. long, linear-subulate, acerose; midrib prominent and margin slightly revolute; flowers short-peduncled; calyx strongly ribbed and generally villous between the ribs; sepals subulate, about equalling the tube, more or less divergent, especially in fruit; corolla bluish, turning white, the tube about twice as long as the calyx; lobes almost orbicular.

It has the general habit of the preceding and the corolla of the next; it differs from *P. multiflora* in the shorter calyx, which is more or less villous, and the longer corolla-tube. It is distinguished from *P. Kelseyi* by the narrow subulate leaves and the lack of ciliation. It grows at an altitude of 3000 m.

MONTANA: Cedar Mountains, July 16, 1897, *Rydberg & Bessey, 4807.*

* **Phlox linearifolia** (Hook.) Gray, Syn. Fl. **2**^{1}: 133; *Phlox speciosa linearifolia* Hook. Kew Journ. Bot. **3**: 289.

Differs from *P. longifolia* in the very narrowly linear leaves, only about 2 mm. wide, the shorter corolla-tube and acerose sepals.

MONTANA: Butte, 1896, *J. F. Kemp.*

* **Phlox Sabini** Dougl.; Hook. Fl. Bor. Am. **2**: 72: *Phlox speciosa Sabini* Gray, Proc. Am. Acad. **3**: 256 [Syn. Fl. **2**^{1}: 134].

Differs from the preceding and *P. speciosa* in the lobes of the corolla, which are not obcordate but truncate-cuneate. Up to an altitude of 2500 m.

MONTANA: Gallatin Co., *Mrs. Hodgman;* Silver Bow Co., *Mrs. Nettie Caspar* (leaves short and broad, calyx about half as long as the corolla-tube; sepals with scarious auricles).

YELLOWSTONE PARK: 1883, *Mary Compton.*

* **Phlox speciosa** Pursh, Fl. Am. Sept. 149 [Syn. Fl. **2**^{1}: 133; Bot. Cal. **1**: 486].

Differs (as well as the following) from *P. longifolia* in the short style and in lacking the salient angles of the calyx.

MONTANA: McDonald's Peak, 1883, *Canby, 232* (a tall specimen); Bozeman, 1885, *Tweedy, 829.*

* **Phlox Kelseyi** Britton, Bull. Torr. Bot. Club, **19**: 225 [Ill. Fl. **3**: 36].

Resembles *P. Stansburyi brevifolia* (*S. longifolia brevifolia* Gray); but the stem is seldom glandular, the corolla larger, bluish and with broader generally entire lobes, the leaves with revolute margins and ciliate below, and the young stems wing-angled.

In rich soil, at an altitude of 1500–2500 m.

MONTANA: Helena, 1881, *Kelsey;* Beaver Head Co., 1888, *F. Tweedy, 30,* in part; East Gallatin Swamps, 1896, *Flodman, 735;* Twin Bridges, 1892, *Mrs. L. A. Fitch.*

* Phlox collina.

Densely cespitose, from a thick caudex: branches with a light-colored almost white shreddy bark and generally covered by the leaves: leaves oblong or ovate, 5–15 mm. long and 2–4 mm. wide, a little ciliate on the margin below and on the lower surface, cuspidate; midrib strong and the margin revolute and chartaceous: flowers sessile; calyx ciliate, strongly ribbed; lobes broadly oblong, acute and cuspidate-tipped, rather shorter than the tube; corolla bluish or seldom white, the tube about half longer than the calyx: lobes rounded obovate, entire or slightly emarginate.

P. collina is intermediate between *P. Kelseyi* on one hand and *P. albomarginata* and *P. diapensioides* on the other. It differs from the first in the more condensed habit, in the shorter and thicker leaves and their hard margins, in the shorter and broader calyx-lobes, the shorter corolla, and the branches which do not show any tendency to become wing-margined. *P. Kelseyi* has lanceolate-subulate calyx-lobes which are longer than the tube. *P. collina* differs from the other two species in the form of the sepals, in being much larger and not densely pulvinate. It grows on dry hills, at an altitude of 1500–3000 m.

MONTANA: Madison Co., 1888, *Tweedy*, *154* (type) and *30*, in part; Upper Missouri, *Dr. V. Havard;* Grafton, 1892, *R. S. Williams*, *768;* Mill Creek, 1887, *Tweedy*, *283;* Park Co., *285;* Belt Mountains, 1883, *Scribner*, *157*.

COLORADO: 1862, *Hall & Harbour*, *454*.

* **Phlox albomarginata** Jones, Zoe, **4**: 367.

This has been distributed under the name *Phlox Richardsonii*, but is distinct from that species. *P. Richardsonii* has much larger flowers, and longer and more flaccid leaves, which are more or less lanate above. *P. albomarginata* is nearer related to *P. Kelseyi*, *P. collina*, *P. caespitosa* and *P. condensata*. From the first two it differs in the more tufted pulvinate habit, the short leaves, the long corolla-tube, being about twice as long as the short calyx, and the densely glandular calyx. From *P. caespitosa* and *P. condensata* it differs in the short and broad leaves and the longer flowers. It differs from all species, except *P. collina* and the next, in the chartaceous margins of the leaves. It grows on dry mountains, at an altitude of 2000–3000 m.

MONTANA: Helena, 1887, *F. W. Anderson;* 1890, *F. D. Kelsey;* Deer Lodge Co., *Miss Frances Hobson*.

* Phlox diapensioides.

Densely pulvinate-caespitose, about 2 cm. high; leaves numerous, crowded, 4–5 mm. long, ovate, sharply mucronate, thick, with a strong midrib and revolute hard margins, more or less glandular-puberulent beneath and ciliate on the midrib and margins; flowers sessile, and only the corolla exserted from the tufts; calyx about 5 mm. long, somewhat glandular; lobes lanceolate, in fruit diverging, nearly as long as the tube; corolla pink-purple, its tube about 8–10 mm. long, about twice as long as the calyx; limb as in the preceding.

This has been labeled *P. caespitosa* and *P. caespitosa condensata*, but is amply distinct from both. It has somewhat the habit of *P. condensata*, whose leaves also have a strong midrib and ciliated involute margin. In *P. condensata*, however, the leaves are linear-lanceolate, straight and almost erect, while in *P. diapensioides* they are curved, spreading and ovate. In the type specimens of the former, in the Columbia Herbarium, the limb of the corolla is only 5 mm. in diameter, while in the latter it is almost twice as broad. *P. diapensioides* is evidently nearest related to the preceding, differing in the sessile flowers, the less glandular calyx and the shorter corolla-tube: in *P. diapensioides* this is about twice as long as the calyx, while in *P. Andersonii* it is about three times as long. Grows on dry hills, at an altitude of 2000–3000 m.

MONTANA: Madison Valley, 1887, *Tweedy, 282;* Beaver Head Co., 1888, *29;* Pole Creek, July 4, 1897, *Rydberg & Bessey, 4816;* Mt. Helena, 1882, *Canby* (densely pulvinate and with small leaves, the calyx-lobes long in fruit); 1887, *Kelsey;* 1883, *Canby, 230* (differs from the ordinary form in the stem which is 3 cm. high, and in the calyx with its long spinose tips).

* **Collomia grandiflora** Dougl.; Lindl. Bot. Reg. *1174* [Syn. Fl. **2**^{1}: 135; Bot. Cal. **1**: 487]: *Gilia grandiflora* Gray, Proc. Am. Acad. **17**: 223 [Syn. Fl. **2**^{1}: 408].

Like the next, but taller; corolla twice as large. Plains, rare.

MONTANA: Coeur d'Alene, 1891, *Kelsey.*

Collomia linearis Nutt. Gen. Pl. **1**: 126 [Ill. Fl. **3**: 42; Syn. Fl. **2**^{1}: 135; Bot. Cal. **1**: 486]; *Gilia linearis* Gray, Proc. Am. Acad. **17**: 223 [Syn. Fl. **2**^{1}: 408; Man. R. M. 249].

In wet sandy soil, up to an altitude of 2500 m.

MONTANA: Bozeman, 1887, *F. Tweedy, 287;* Spanish Basin, 1896, *Flodman, 738;* June 26–30, 1897, *Rydberg & Bessey, 4829, 4830, 4832* and *4833;* Bridger Mountains, June 14, *4831;* Bozeman, 1895, *Rydberg, 2763;* Clendenin, 1882, *R. S. Williams, 143;* Lewis and Clarke Co., *Mrs. Muth:* 1883, *Scribner, 159.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 297;* Mammoth Hot Springs, 1885, *822.*

* **Collomia aristella** (Gray); *Gilia aristella* Gray, Syn. Fl. **2**^{1}: 408.

Like a small form of the preceding, but with aristiform calyx-lobes. Rare.

MONTANA: Prickly Pear Cañon, 1887, *R. S. Williams, 811.*

Collomia gracilis (Hook.) Dougl.; Benth. Bot. Reg. *1622* [Syn. Fl. **2**^{1}: 135; Bot. Cal. **1**: 488]; *Gilia gracilis* Hook. Bot. Mag. *2924* [Syn. Fl. **2**^{1}: 408; Ill. Fl. **3**: 38; Man. R. M. 249].

Hillsides, up to an altitude of 2000 m.

MONTANA: Bozeman, 1887, *F. Tweedy, 288;* Spanish Basin, June 28, 1897, *Rydberg & Bessey, 4825;* Bridger Mountains, June 10–11, *4823* and *4824;* Sand Coulee, 1888, *R. S. Williams, 172;* Bozeman, 1892, *W. T. Shaw;* Bozeman, 1883, *Scribner, 160.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *F. Tweedy, 824.*

* **Linanthus Harknessii** (Curran) Greene, Pittonia, **2**: 255; *Gilia Harknessii* Curran, Bull. Calif. Acad. **1**: 12 [Syn. Fl. **2**¹: 407].

A very slender plant, nearest resembling *L. linifolia* (Benth.) Greene, with filiform leaves, and small flowers about 2 mm. long. Waste places, old fields, etc., up to an altitude of 2500 m.

MONTANA: Bridger Mountains, 1896, *Flodman, 737;* Spanish Basin, June 23, 1897, *Rydberg & Bessey, 4821;* Trout Creek, 1891, *R. S. Williams, 481;* Ross' Hole, 1880, *Watson.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 296;* 1885, *821;* Upper Yellowstone, 1871, *Hayden Survey.*

Gilia pungens (Torr.) Benth.; DC. Prod. **9**: 316 [Ill. Fl. **3**: 38; Syn. Fl. **2**¹: 140; Man. R. M. 250; Bot. Cal. **1**: 493]; *Cantua pungens* Torr. Ann. Lyc. N. Y. **2**: 26.

Plains, up to an altitude of 2500 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 150;* Cliff Lake, July 27, 1897, *Rydberg & Bessey.*

YELLOWSTONE PARK: Tower Falls, 1885, *Tweedy, 525.*

* **Gilia debilis** Wats. Am. Nat. **8**: 302 [Rothr. Wheeler's Rep. *pl. 19;* Syn. Fl. **2**¹: 147].

A small plant, growing among rocks, with numerous slender stems, leafy only at the top, which reach above the loose rocks. The Montana plants differ from the type, as figured in Wheeler's Report, in having nearly always entire spatulate leaves; it may be distinct. I have not seen the type. The flowers are yellowish or rose-tinged, trumpet-shaped and equal the leaves. If not a form of *G. debilis*, it belongs to the same group as that and *G. Larseni* and, perhaps, should be excluded from the genus. It grows at an altitude of about 3000 m.

MONTANA: Lone Mountain, 1886, *Tweedy, 1080;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4822;* Jocko Lake, 1880, *Watson;* McDonald's Peak, 1883, *Canby, 234,* in part; Jocko River, *234,* in part (more typical).

Gilia cephaloidea Rydb. Bull. Torr. Bot. Club, **24**: 293; *Gilia spicata capitata* Gray, Syn. Fl. **2**^{1}: 144, in part [Man. R. M. 251, in part]; not Gray, Proc. Am. Acad. **8**: 274; not *G. capitata* Sims.

Differs from *G. spicata* in the subcapitate inflorescence, the pure white, not greenish white, corolla, with the tube only one-third or one-half longer than the calyx, and the elliptic corolla-segments. Dry hills, at an altitude of 1500–2500 m.

MONTANA: Lima, 1895, *Rydberg, 2764;* Bridger Mountains, June 15, 1897, *Rydberg & Bessey, 4819;* Helena, 1891, *F. D. Kelsey;* Beaver Head Co., 1888, *Tweedy, 151;* Gallatin Co., *Mrs. Alderson;* Melrose, 1888, *Tweedy, 31;* Madison River, 1883, *Scribner, 161.*

Gilia congesta Hook. Fl. Bor. Am. **2**: 75 [Syn. Fl. **2**^{1}: 144; Ill. Fl. **3**: 40; Man. R. M. 251; Bot. Cal. **1**: 496].

On dry hills, at an altitude of 1500–2500 m.

MONTANA: Melrose and Beaver Head Co., 1888, *F. Tweedy, 31,* in part; *F. W. Anderson.*

Gilia tenerrima Gray, Proc. Am. Acad. **8**: 277 [Syn. Fl. **2**^{1}: 146; Man. R. M. 252].

In valleys, at an altitude of 2000–2500 m.

MONTANA: Bear Gulch, Park Co., 1887, *F. Tweedy, 286;* Spanish Basin, June 24, 1897, *Rydberg & Bessey, 4820.*

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy, 820.*

* Gilia parvula.

Annual, only 2–3 cm. high, glabrous; stem naked from the persistent small cotyledons to the inflorescence, which is capitate; bracts foliaceous, ovate-lanceolate, 5–15 mm. long, often tinged with red; calyx about 3 mm. long, its lobes ovate, acute: corolla white or pinkish, 6–8 mm. long, salverform, the tube somewhat cyanthiform-dilated at the throat; limb with narrowly obovate acutish lobes 1–1.5 mm. long; anthers short, sessile in the throat of the corolla; capsule 3–4 mm. long, ovoid, containing about a dozen seeds.

This has been confused with *G. nudicaulis*, to which it is nearest related; it differs, however, in being smaller and having smaller flowers. In *G. nudicaulis* the lobes of the corolla are broadly cuneate, truncate, undulate-toothed at the apex, and 3–4 mm. long. In sandy places, at an altitude of 1500–2500 m.

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 823.*

WYOMING: Horse Creek, 1894, *Aven Nelson, 193;* Northwestern Wyoming, 1873, *C. C. Parry, 235.*

Gilia aggregata (Pursh) Sprengel, Syst. **1**: 626 [Ill. Fl. **3**: 39; Syn. Fl. **2**^{1}: 145; Man. R. M. 249; Bot. Cal. **1**: 496]; *Cantua aggregata* Pursh, Fl. Am. Sept. 147.

Rocky ravines.

MONTANA: Coeur d'Alene Mountains, 1891, *Kelsey.*

Gilia inconspicua Sweet, Hort. Brit. 286 [Syn. Fl. **2**^{1}: 148; Man. R. M. 252: Bot. Cal. **1**: 498].

Gravelly ground, up to an altitude of 2000 m.

MONTANA: Beaver Head Co., 1888, *Tweedy, 149.*

Navarretia minima Nutt. Journ. Acad. Nat. Sci. Phila. (II.) **1**: 160 [Ill. Fl. **3**: 42]; *Gilia minima* Gray, Proc. Am. Acad. **8**: 269 [Syn. Fl. **2**^{1}: 140; Man. R. M. 250].

Dry hills, up to an altitude of 2000 m.

MONTANA: Highwood Creek, 1888, *R. S. Williams, 778.*

Polemonium pulchellum Bunge: Ledeb. Fl. Alt. **1**: 233; *Polemonium humile pulchellum* Gray, Syn. Fl. **2**^{1}: 150 [Man. R. M. 253].

Hillsides, up to an altitude of 2500 m.

MONTANA: Little Belt Mts., 1896, *Flodman, 741* (?); Anaconda, 1891, *S. A. Merritt;* Deer Lodge, *Frances Hobson.*

Polemonium parvifolium Nutt.; Rydb. Bull. Torr. Bot. Club, **24**: 253: *Polemonium viscosum* Gray, Proc. Am. Acad. **7**: 280 [Syn. Fl. **2**^{1}: 150: Man. R. M. 253]; not Nutt.

Valleys and hillsides, up to an altitude of 3000 m.

MONTANA: *Wyeth;* Bridger Mts., June 15, 1897, *Rydberg & Bessey, 4838;* Elliston, 1890, *F. D. Kelsey;* Grizzly Peak, 1887, *F. Tweedy, 281;* Spanish Basin, 1896, *Flodman, 739* and *740;* Bridger Mts., June 18, 1897, *Rydberg & Bessey, 4839* and *4840;* June 15, *4841;* Spanish Basin, June 26, *4842;* Belt River, 1892, *R. S. Williams, 30;* Anaconda, 1892, *Kelsey; S. A. Merritt;* Madison Co., *Mrs. L. S. Fitch;* Blackfoot River, 1883, and Upper Marias Pass, 1883, *Canby, 236;* Lake Plateau, 1897, *P. Koch, 78;* Deer Lodge Co., *Emma Ware.*

YELLOWSTONE PARK: Stevenson's Island, 1871, *Hayden Survey;* 1886, *Francis Hall;* 1893, *Addison Brown;* Gardiner, 1885, *F. Tweedy, 818;* Indian Creek, 1884, *30.*

Polemonium occidentale Greene, Pittonia, **2**: 75; *Polemonium coeruleum* Gray, Proc. Am. Acad. **7**: 281, in part [Bot. Cal. **1**: 500; Syn. Fl. **2**^{1}: 151, in part; Man. R. M. 253]; not L.

MONTANA: Southwestern, 1888, *F. Tweedy, 155;* Deer Lodge Co., *Emma Ware;* Silver Bow Co., *Mrs. Moore;* Bitter Root Valley, 1880, *Watson* (?).

YELLOWSTONE PARK: 1886, *Francis Hall;* Indian Creek, 1884, *Tweedy;* 1883, *Miss Mary Compton.*

Polemonium viscosum Nutt. Journ. Acad. Nat. Sci. Phila. (II.) **1**: 154 [Rydb. Bull. Torr. Bot. Club, **24**: 252].

Nearest related to *P. confertum* Gray, but has smaller segments to the leaves, and a shorter more open dark-blue corolla. Mountain tops, at an altitude of about 3000 m.

MONTANA: Park Co., 1887, *F. Tweedy, 280:* Little Belt Mountains, 1896, *Flodman, 742;* Cedar Mountains, July 16, 1897, *Rydberg & Bessey, 4837;* Bridger Mountains, June 15, *4836* (white-flowered): Bridger Mountains, June 15, *4834;* McDonald's Peak, 1883, *Canby, 235;* Belt Mountains, 1883, *Scribner, 162.*

YELLOWSTONE PARK: 1884, *Tweedy, 31.*

IDAHO: Mt. Chauvet, July 27, 1897, *Rydberg & Bessey, 4835* (white-flowered).

Polemonium confertum Gray, Proc. Acad. Nat. Sci. Phila. **1863**: 73 [Syn. Fl. **2**^{1}: 150; Man. R. M. 253; Bot. Cal. **1**: 500].

On mountain tops, at an altitude of 2500 m. or more.

MONTANA: Lima, 1895, *Rydberg, 2765;* Yogo, 1888, *R. S. Williams, 489;* Stillwater, 1897, *P. Koch, 60;* Terminus and Odell's, 1880, *Watson.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 31.*

* **Polemonium micranthum** Benth.; DC. Prod. **9**: 318 [Syn. Fl. **2**^{1}: 151; Bot. Cal. **1**: 499].

A small annual plant with an almost rotate corolla 3–7 mm. in diameter. Plant somewhat viscid-pubescent. In springy places.

MONTANA: Livingston, 1883, *Scribner, 164.*

HYDROPHYLLACEAE.

* **Hydrophyllum capitatum** Dougl.; Benth. Trans. Linn. Soc. **17**: 273: [Syn. Fl. **2**^{1}: 154: Bot. Cal. **1**: 502].

A species characterized by the peduncles which are shorter than the petioles, and subcapitate cymes. In alluvial soil, especially along mountain brooks, at an altitude of 1500–2500 m.

MONTANA: Hell Gate, *John Pearsall* (Mullan Expedition), *841;* Grizzly Creek, 1887, *F. Tweedy, 244;* Bozeman, 1882; 1885, *403;* Bridger Mts., June 10–12, 1897, *Rydberg & Bessey, 4861;* Sand Coulee, 1888, *R. S. Williams, 350;* Bozeman, 1892, *W. T. Shaw;* Missoula Co., *Mrs. Kennedy;* Upper Marias Pass, 1883, *Canby, 237;* Bozeman Pass, *Scribner, 165.*

YELLOWSTONE PARK: *Dr. Chas. H. Hall*, 1888.

* **Nemophila breviflora** Gray, Proc. Am. Acad. **10**: 315 [Syn. Fl. **2**[1]: 157; Bot. Cal. **1**: 504].

A species somewhat resembling *Macrocalyx* in general habit, in the corolla which is shorter than the calyx, and in the calyx which enlarges in fruit. It differs, however, in the conspicuous appendages of the calyx and the short leaves. In alluvial soil, at an altitude of 1500–2500 m.

MONTANA: Bridger Mts., June 12, 1897, *Rydberg & Bessey, 4860;* Cedar Mountain, July 16, *4859.*

YELLOWSTONE PARK: Soda Butte, 1885, *Tweedy, 405.*

Macrocalyx Nyctelea (L.) Kuntze, Rev. Gen. Pl. 434 [Ill. Fl. **3**: 45]; *Ipomoea Nyctelea* L. Sp. Pl. 160; *Ellisia Nyctelea* L. Sp. Pl. Ed. 2, 1662 [Syn. Fl. **2**[1]: 157: Man. R. M. 255].

In rich soil, in shaded places, up to an altitude of 2500 m.

MONTANA: Bozeman, 1882, *F. Tweedy, 243;* Pony, July 6, 1897, *Rydberg & Bessey, 4858;* Bridger Mountains, June 12, *4857;* Helena, 1891, *F. D. Kelsey;* Great Falls, 1888, *R. S. Williams, 127;* Gallatin Co., *Mrs. Alderson;* Shields River, 1883, *Scribner, 166.*

YELLOWSTONE PARK: Mammoth Hot Springs and Soda Butte, 1885, *Tweedy, 404.*

Phacelia heterophylla Pursh, Fl. Am. Sept. 140; *Phacelia circinata* Gray, Syn. Fl. **2**[1]: 159, mainly [Bot. Cal. **1**: 506; Man. R. M. 255]; not Jacq.

Dry soil, at an altitude of 1500–2000 m.

MONTANA: Trail Creek, 1887, *F. Tweedy, 248;* Melrose, 1895, *Rydberg, 2766;* Spanish Basin, 1896, *Flodman, 743;* June 26, 1897, *Rydberg & Bessey, 4850.*

* **Phacelia leucophylla** Torr. Frem. Rep. 93; *Phacelia circinata* Gray, l. c., in part.

Differs from *P. heterophylla* in the dense white pubescence. In rocky places, at an altitude of 1500–2500 m.

MONTANA: Mill Creek, 1887, *F. Tweedy, 245;* Melrose, 1895, *Rydberg, 2767;* Spanish Basin, June 23, 1897, *Rydberg & Bessey, 4852* and *4853:* Pony, July 8, *4851* (white-flowered): Belt River, 1881, *R. S. Williams, 123;* Silver Bow Co., *Mrs. Ida Christie;* Shields River, 1883, *Scribner, 167.*

YELLOWSTONE PARK: 1885, *F. Tweedy, 402.*

* Phacelia alpina.

Perennial by a short rootstock, about 2 dm. high, somewhat grayish-strigose and hirsute, especially on the upper parts; basal leaves numerous, oblong-lanceolate or oblanceolate, entire, acute, tapering into the petiole, somewhat grayish-strigose, about 5 cm. long; stem-leaves similar, but short-petioled, or the upper subsessile; inflorescence compound, the branches ascending, the lower ones naked for about 3 cm., then bearing one or two scorpioid clusters which are 1–2 cm. long: calyx hispid, its lobes about 3 mm. long, linear, obtuse or acutish; corolla 5–6 mm. long and 4 mm. broad, lilac, its lobes rounded; stamens about twice as long as the corolla, slightly bearded, with two broad and salient appendages attached to the base.

It is nearest related to *P. heterophylla* and *P. leucophylla;* differs from both in the smaller flowers and the long lower branches of the inflorescence: it most resembles the latter, but is less strigose, not white, but merely grayish. It grows among rocks, on high mountains, at an altitude of about 3000 m.

MONTANA: Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4855* (type): Indian Creek, July 22, *4856:* Melrose, 1895, *Rydberg, 2767.*

YELLOWSTONE PARK: 1886, *Francis Hall:* 1873, *C. C. Parry, 229:* Mammoth Hot Springs, 1884, *Tweedy:* Hoodoo Peak, 1897, *P. Koch, 19.*

Phacelia sericea (Graham) Gray, Am. Journ. Sci. (II.) **34**: 254 [Syn. Fl. **2**^{1}: 166: Man. R. M. 256; Bot. Cal. **1**: 508]: *Eutoca sericea* Graham, Hook. Bot. Reg. *3003.*

In the mountains, up to an altitude of 3000 m.

MONTANA: Beaver Head Co., 1888, *Tweedy, 86;* Helena, 1887, *F. D. Kelsey:* Lima, 1895, *Rydberg, 2768;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4847;* Indian Creek, July 22, *4846;* Upper Sand Coulee, 1887, *R. S. Williams, 168;* McDonald's Peak, 1883, *Canby, 238;* Beaver Creek, *Scribner, 168;* Pleasant Valley, 1871, *G. N. Allen.*

YELLOWSTONE PARK: 1884, *Tweedy, 282.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4845.*

* **Phacelia Lyallii** (Gray); *Phacelia sericea Lyallii* Gray, Proc. Am. Acad. **10**: 323 [Syn. Fl. **2**¹: 166].

Like the last, but greener; leaves more simply pinnatifid. At an altitude of 2000–3000 m.

MONTANA: Spanish Basin, 1896, *Flodman, 744* and *745;* Mill Creek, Park Co., 1887, *F. Tweedy, 246;* Lake Plateau, 1897, *P. Koch, 29;* Upper Marias Pass and McDonald's Peak, 1883, *Canby, 239.*

YELLOWSTONE PARK: *Dr. Chas. H. Hall,* 1888.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4844.*

* **Phacelia Idahoensis** Henderson, Bull. Torr. Bot. Club, **22**: 48.

Taller than *P. Lyallii*, with narrower and longer inflorescence, smaller flowers and shorter stamens. At an altitude of 2000 m.

MONTANA: Spanish Basin, 1896, *Flodman, 746.*

Phacelia glandulosa Nutt. Jour. Acad. Sci. Phila. (II.) **1**: 160 [Syn. Fl. **2**¹: 160; Man. R. M. 256].

Gravelly soil, up to an altitude of 2000 m.

MONTANA: Soap Gulch, Silver Bow Co., 1888, *Tweedy, 87;* Sheridan, 1892, *Mrs. L. A. Fitch;* Madison Co., *Mrs. Fitch;* Bozeman, 1892, *W. T. Shaw;* Shinberger's Ranch, 1880, *Watson.*

* **Phacelia Franklinii** Gray, Man. Ed. 2: 329 [Ill. Fl. **3**: 47; Syn. Fl. **2**¹: 166; Bot. Cal. **1**: 509].

An annual villous-pubescent plant with pinnatifid leaves. Shores of lakes and streams, up to an altitude of 2500 m.

MONTANA: Helena, 1889, *F. D. Kelsey;* Glendale, 1888, *F. Tweedy, 88;* Pony Mountains, July 9, 1897, *Rydberg & Bessey, 5043;* Silver Bow Co., *Mrs. Moore;* Deer Lodge, *Emma Ware.*

YELLOWSTONE PARK: 1884, *Tweedy, 283;* Tower Falls, 1885, *400;* Near the Lake, 1872, *W. B. Platt* (Hayden Survey).

Phacelia linearis (Pursh) Holz. Contr. U. S. Nat. Herb. **3**: 242; *Hydrophyllum lineare* Pursh, Fl. Am. Sept. 134; *Eutoca Menziesii* R. Br. Frank. Journ. 764; *Phacelia Menziesii* Torr.; Wats. King's Exp. **5**: 252 [Syn. Fl. **2**¹: 166; Bot. Cal. **1**: 510; Man. R. M. 256].

In open rich soil, up to an altitude of 2500 m.

MONTANA: Helena, 1889, *F. D. Kelsey;* Silver Bow Co., 1888, *Tweedy, 85;* Mill Creek, 1887, *247;* Missoula, 1882: Melrose, 1895, *Rydberg, 2769* and *2770;* Bozeman, 1896, *Flodman, 747;* Spanish Basin, June 23, 1897, *Rydberg & Bessey, 4849;* Bridger Mountains, June 11, *4848*: Great Falls, 1891, *R. S. Williams, 132;* Lewis and Clarke Co., *Mrs. Murphy;* Bozeman, 1892, *W. T. Shaw;* Helena, 1883, *Scribner, 169.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* 1883, *Miss Compton;* Custer Co., 1892, *Mrs. Light.*

* **Capnorea nana** (Lindl.) Raf. Fl. Tel. **3**: 75: *Nicotiana nana* Lindl. Bot. Reg. *833*. 1824: *Ourisia Californica* Benth. Pl. Hartw. 327. 1832; *Hesperochiron Californicus* Wats. King's Exp. **5**: 281 [Bot. Cal. **1**: 516; Syn. Fl. **2**^{1}: 173]; *H. nanus* Greene, Bull. Torr. Bot. Club, **15**: 110.

The genus has been referred to both *Gentianaceae* and *Hydrophyllaceae*. The structure of the flower resembles more perhaps that of the latter than of the former, but the general habit is so unlike any of the genera of *Hydrophyllaceae* that it is very doubtful if it belongs there. The flowers are borne on naked one-flowered peduncles arising from the base, the leaves are entire, spatulate, on wing-margined petioles, the corolla has no disk, and the ovary is one-celled but the narrow placenta makes it almost half two-celled; the corolla is campanulate with short lobes. It was first described as a solanaceous plant and it has a strong resemblance to that family. Hills and meadows.

MONTANA: Locality not given, *F. W. Anderson;* Grasshopper Valley, 1880, *Watson.*

* **Capnorea pumila** (Griseb.) Greene, Erythea, **2**: 193: *Villarsia pumila* Griseb. Hook. Fl. Bor. Am. **2**: 70; *Hesperochiron pumilus* Porter; Hayden, Geol. Rep. **1872**: 768 [Bot. Cal. **1**: 516: Syn. Fl. **2**^{1}: 173].

Like the last, but the almost rotate corolla with comparatively longer lobes. In springy places.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Gallatin Co., 1888, *F. Tweedy, 50;* Helena, 1887, *F. W. Anderson, 490;* Deer Lodge, 1888, *Geo. R. Kelsey.*

BORAGINACEAE.

Heliotropium Curassavicum L. Sp. Pl. 130 [Ill. Fl. **3**: 52; Man. R. M. 258; Syn. Fl. **2**^{1}: 185; Bot. Cal. **1**: 521].

MONTANA: Great Falls, 1890, *R. S. Williams, 542;* Teton River, 1883, *Scribner, 170.*

Eritrichium aretioides DC. Prod. **10**: 125; *Eritrichium nanum aretioides* Herder; Radde, Reisen, **4**: 253 [Syn. Fl. **2**¹: 191]; *Omphalodes nana aretioides* Gray, Proc. Am. Acad. **20**: 262 [Man. R. M. 259].

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 82;* Park Co., 1889; Gallatin Peak, 1886, *1176;* Lima, 1895, *Rydberg, 2772;* Park Co., 1884, *Tweedy;* Old Hollowtop, Pony Mts., July 9, 1897, *Rydberg & Bessey, 4890;* Sheridan, 1892, *Mrs. L. A. Fitch;* Madison Co., *Mrs. Fitch;* Bald Mountain, 1880, *Watson.*

YELLOWSTONE PARK: Mt. Holmes, 1884, *Tweedy, 197.*

* Eritrichium aretioides elongatum.

Flowering stems 3–4 cm. long, covered with oblong erect leaves, 8–10 mm. long.

This may be a distinct species, but the material is rather meager. The typical *E. aretioides* is generally stemless, but if the flowering branches rise 2–3 cm. above the basal clusters of leaves, the stem-leaves are very short and mostly divergent; the variety, therefore, differs much in general habit, although other technical characters, so far as I can find, are lacking.

Rare on dry hills, at an altitude of 2000 m.

MONTANA: Spanish Basin, June 26, 1897, *Rydberg & Bessey, 4891;* Belt Mountains, 1883, *Scribner, 173.*

Eritrichium Howardii (Gray): *Cynoglossum Howardii* Gray, Syn. Fl. **2**¹: 188; *Omphalodes Howardii* Gray, l. c. 423 [Man. R. M. 259].

MONTANA: Livingston, 1889, *F. Tweedy;* Bozeman, 1882; Tiger Butte, 1887, *R. S. Williams, 349;* Lewis and Clarke Co., *Mrs. Muth* and *Mrs. Murphy;* Mt. Helena, 1883, *Canby, 242.*

* **Cynoglossum officinale** L. Sp. Pl. 134 [Ill. Fl. **3**: 53; Syn. Fl. **2**¹: 187].

An introduced species with large obovate-oblong leaves, large flowers and spiny flattened fruit.

YELLOWSTONE PARK: 1883, *Mary Compton.*

* **Lappula diffusa** (Lehm.) Greene, Pittonia, **2**: 182; *Echinospermum diffusum* Lehm. Pug. **2**: 23 [Syn. Fl. **2**¹: 422].

A perennial species with bright blue flowers 1–2 cm. in diameter, simple stems, soft pubescence, and with very flat marginal prickles. Mountain sides, at an altitude of 1500–2000 m.

MONTANA: Bridger Mountains, June 12, 1897. *Rydberg & Bessey, 4897;* Upper Sand Coulee, 1888, *R. S. Williams.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885. *Tweedy, 806.*

* Lappula coerulescens.

Stems several, from a perennial root, ascending, 4–6 dm. high, grayish-strigose, simple up to the inflorescence; basal leaves 5–10 cm. long, rather numerous: blade oblanceolate or spatulate, obtuse, grayish-strigose and ciliate-margined, tapering into a winged petiole: stem-leaves oblong, 2–5 cm. long, sessile or the upper ones somewhat clasping; inflorescence open and rather loosely flowered; calyx strigose, its lobes oblong, obtuse, about 2 mm. long; corolla 6–10 mm. in diameter, whitish or more often light sky-blue, and always more or less distinctly veined with blue.

Nearest related to *L. diffusa*, but the flowers are smaller, always blue-veined, and the pubescence is much shorter and appressed, except the longer ciliation on the margin of the leaves, this latter character also separating it from *L. hispida*. It may be close to *L. ciliata*, which I have not seen, the pubescence in which, according to the description, must be like that of the present species. The corolla of *L. ciliata*, however, is described as blue, and the leaves as linear or narrowly lanceolate, which is never the case in *L. coerulescens*. It is rather common on hillsides, at an altitude of 1500–2500 m.

MONTANA: Bridger Mountains, June 15 and 18, 1897, *Rydberg & Bessey, 4898* and *4899* (type); Lima, 1895, *Rydberg, 2774;* Bozeman, 1892, *W. T. Shaw;* Bozeman Pass, 1883, *Canby, 241.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 85.*

Lappula floribunda (Lehm.) Greene, Pittonia, **2**: 182 [Ill. Fl. **3**: 55]; *Echinospermum floribundum* Lehm. Pug. **2**: 24 [Syn. Fl. **2**^{1}: 189; Man. R. M. 258]; *E. deflexum floribundum* Wats. Bot. Cal. **1**: 530.

In valleys, at an attitude of 1000–2500 m.

MONTANA: 1888, *F. D. Kelsey;* Bozeman, 1887, *F. Tweedy, 224;* Park Co., 1887, *222;* Bridger Mts., June 10–17, 1897, *Rydberg & Bessey, 4894* and *4896;* Spanish Basin, June 26, *4895;* West Gallatin, 1892, *W. T. Shaw;* Silver Bow Co., *Mrs. Moore;* Bozeman Pass, 1883, *Canby, 240;* 1883, *Scribner, 171.*

YELLOWSTONE PARK: 1883, *Mary Compton.*

* Lappula leptophylla.

Stem from a biennial or perennial taproot, 6–8 dm. high, terete, finely pubescent or hirsutulous with reflexed hairs, leafy, branched above, the branches erect or ascending; basal leaves oblanceolate; stem-leaves lanceolate, very thin, subsessile, 1–2 dm. long, finely and somewhat scabrous-pubescent: inflorescence very leafy, much branched and many-flowered; flowers very small; sepals oblong, obtuse, about 1 mm. long; corolla blue, 2–3 mm. in diameter; fruit about 5 mm. in diameter; nutlets beset on the margins with intermixed flattened linear-lanceolate prickles varying in length, the larger fully 3 mm. long, the back finely puberulent, smooth or slightly muriculate, not prickly.

The species is intermediate between *L. floribunda* and *L. Americana*. It has the leafy stem, compound inflorescence and large fruit of the former, but the small flowers and thin leaves of the latter. It grows in shaded lowlands, at an altitude of about 1600 m.

MONTANA: Bozeman, 1887, *Tweedy*, *223;* Gallatin Co., 1886, *Tweedy*, *1174*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* 1884, *Tweedy*, *191*, in part.

* **Lappula Americana** (Gray) Rydb. Bull. Torr. Bot. Club, **24**: 294 [Ill. Fl. **3**: 56]; *Echinospermum deflexum Americanum* Gray, Proc. Am. Acad. **17**: 224 [Syn. Fl. **2**^{1}: 421]; *Echinospermum deflexum* Gray, Syn. Fl. **2**^{1}: 189; not Lehm.

Resembling somewhat *L. floribunda*, but with shorter leaves, simple inflorescence, and small flowers and fruit; nutlets 2–3 cm. long, with only marginal prickles. At an altitude of 1000–2000 m.

MONTANA: Deer Lodge, 1895, *Rydberg*, *2775;* Helena, 1882, *Canby*.

Lappula occidentalis (Wats.); *Cynoglossum pilosum* Nutt. Gen. **1**: 114; not R. & P.; *Echinospermum patulum* Lehm.: Hook. Fl. Bor. Am. **2**: 84; not Lehm. Asp. 124; *Echinoglossum Redowskii occidentale* Wats. King's Exp. **5**: 246 [Syn. Fl. **2**^{1}: 189; Bot. Cal. **1**: 529; Man. R. M. 259].

In dry loose soil, up to an altitude of 2500 m.

MONTANA: Helena, 1888, *F. D. Kelsey;* Beaver Head Co., 1888, *Tweedy*, *78;* Spanish Basin, June 23, 1897, *Rydberg & Bessey*, *4893;* Great Falls, 1887, *R. S. Williams*, *691;* Cottonwood Creek, 1892, *W. T. Shaw;* Gallatin Co., *Mrs. Hodgman;* Lewis and Clarke Co., *Mrs. F. Harwood;* Custer Co., *Mrs. Light*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *F. Tweedy, 308.*

Lappula Texana (Scheele) Britton, Mem. Torr. Bot. Club, **5**: 273 [Ill. Fl. **3**: 55]; *Echinospermum Texanum* Scheele, Linnaea, **25**: 260: *Echinospermum Redowskii cupulatum* Gray; Brew. & Wats. Bot. Cal. **1**: 530 [Syn. Fl. **2**^{1}: 190: Man. R. M. 259].

On dry plains and hills, up to an altitude of 2000 m.

MONTANA: Big Hole River, 1888, *F. Tweedy, 76;* Jack Creek, July 19, 1897, *Rydberg & Bessey, 4892;* Gallatin City, 1883, *Scribner, 172.*

Allocarya scopulorum Greene, Pittonia, **1**: 16 [Ill. Fl. **3**: 56]; *Eritrichium Californicum* Gray, Syn. Fl. **2**^{1}: 191, in part [Bot. Cal. **1**: 526]; not DC.: *Krynitzkia Californica* Gray, Proc. Am. Acad. **20**: 266 [Syn. Fl. **2**^{1}: 423; Man. R. M. 260].

In springy and muddy soil, up to an altitude of 2500 m.

MONTANA: Big Hole River, 1888, *F. Tweedy, 77;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4880;* Sand Coulee, 1888, *R. S. Williams, 777.*

YELLOWSTONE PARK: 1885, *F. Tweedy, 817;* Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey, 4881.*

Cryptanthe crassisepala (T. & G.) Greene, Pittonia, **1**: 112 [Ill. Fl. **3**: 57]; *Eritrichium crassisepalum* T. & G. Pac. R. R. Rep. **2**: 171 [Syn. Fl. **2**^{1}: 195]; *Krynitzkia crassisepala* Gray, Proc. Am. Acad. **20**: 268 [Ill. Fl. **2**^{1}: 424; Man. R. M. 260].

In dry loose soil, especially around "prairie dog towns," up to an altitude of 2500 m.

MONTANA: Gallatin Co., 1886, *F. Tweedy, 175;* Bozeman, 1887, *219;* Helena, 1891, *F. D. Kelsey;* Silver Bow Co., *Mrs. Moore;* Great Falls, 1887, *R. S. Williams.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 195.*

* **Cryptanthe affinis** (Gray) Greene, Pittonia, **1**: 119; *Krynitzkia affinis* Gray, Proc. Am. Acad. **20**: 270 [Syn. Fl. **2**^{1}: 425].

This and the next differ from *C. Watsoni* and its allies in the groove of the nutlets which is simple and continuous to the base. In *C. affinis* the nutlets are thin-walled and attached up to the middle of the gynobase. Both this and the next are diffuse in habit. In dry soil, at an altitude of 2200 m.

YELLOWSTONE PARK: Upper Madison Cañon, Aug. 3, 1897, *Rydberg & Bessey, 4884;* Helena, *F. D. Kelsey.*

* **Cryptanthe leiocarpa** (F. & M.) Greene, Pittonia, **1**: 117; *Echinospermum leiocarpum* F. & M. Ind. Sem. Petr. **2**: 36; *Eritrichium leiocarpum* Wats. King's Exp. **5**: 244 [Syn. Fl. **2**^{1}: 194; Bot. Cal. **1**: 527]; *Krynitzkia leiocarpa* F. & M. Ind. Sem. Petr. **7**: 52 [Syn. Fl. **2**^{1}: 425].

Resembling the preceding, but the thicker-walled nutlets are attached by their whole length to the subulate gynobase. Dry soil, up to an altitude of 2500 m.

MONTANA: Helena, 1891, *F. D. Kelsey.*

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 4888;* Yellowstone River, 1884, *Tweedy, 1194.*

Cryptanthe Watsonii (Gray) Greene, Pittonia, **1**: 120; *Krynitzkia Watsonii* Gray, Proc. Am. Acad. **20**: 271 [Syn. Fl. **2**^{1}: 426; Man. R. M. 261].

On hillsides, at an altitude of 1500–2500 m.

MONTANA: Gallatin Co., 1886, *F. Tweedy, 1173;* Tiger Butte, 1886, *R. S. Williams.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 193,* in part.

* **Cryptanthe Torreyi** (Gray); *Eritrichium Torreyi* Gray, Proc. Am. Acad. **10**: 57 [Syn. Fl. **2**^{1}: 192]; *Krynitzkia Torreyana* Gray, Proc. Am. Acad. **20**: 271 [Syn. Fl. **2**^{1}: 425]; *Cryptanthe Torreyana* Greene, Pittonia, **1**: 118.

Like *C. Watsonii*, in that the groove of the nutlet is divergently forked at the base, but the leaves are broad, and the ovate acute nutlets are attached nearly up to the middle of the gynobase. Dry hills, at an altitude of 2000 m.

MONTANA: Indian Creek, July 21, 1897, *Rydberg & Bessey, 4885.*

* **Cryptanthe calycosa** (Gray); *Krynitzkia Torreyana calycosa* Gray, Proc. Am. Acad. **20**: 271 [Syn. Fl. **2**^{1}: 426].

Like *C. Torreyi*, but the sepals are elongated in fruit and rigid with a strong midrib. Dry soil, up to an altitude of 2500 m.

MONTANA: Bozeman, 1887, *F. Tweedy, 217.*

YELLOWSTONE PARK: 1884, *F. Tweedy, 193,* in part, and *194;* East Fork of Yellowstone, 1885, *814.*

* **Cryptanthe ambigua** (Gray) Greene, Pittonia, **1**: 113; *Krynitzkia ambigua* Gray, Proc. Am. Acad. **20**: 273 [Syn. Fl. **2**^{1}: 426].

Somewhat like *C. Watsonii* in habit, but the nutlets are more or less muricate. Valleys, up to an altitude of 2500 m.

MONTANA: Spanish Basin, June 23–24, 1897, *Rydberg & Bessey*, *4886* and *4887*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *F. Tweedy*, *815*.

* **Cryptanthe polycarpa** Greene, Pittonia, **1**: 114.

Resembling somewhat *C. crassisepala* in habit, but without the thickness of the sepals. Its muriculate nutlets are also uniform, ovate-deltoid, gray spotted with brown and with a small triangular areola.

MONTANA: 1889, *F. D. Kelsey*: Virginia City, 1871, *G. M. Allen* (Hayden Survey).

* **Cryptanthe Kelseyana** Greene, Pittonia, **2**: 232.

Nearest related to *C. Pattersonii*, but differing in the form of the nutlets. In *C. Pattersonii* they are equal and smooth; in *C. Kelseyi* three are gray, ovate, acuminate, and sparsely tuberculate, the fourth much smaller, red and smooth.

MONTANA: Ellison, 1889, *F. D. Kelsey* (according to Greene); Bridger Mountains, June 11, 1887, *Rydberg & Bessey*, *4889*; Missoula, 1898, *Williams & Griffith*.

Oreocarya glomerata (Pursh) Greene, Pittonia, **1**: 58 [Ill. Fl. **3**: 58]; *Cynoglossum glomeratum* Pursh, Fl. Am. Sept. 729; *Krynitzkia glomerata* Gray, Proc. Am. Acad. **20**: 279 [Syn. Fl. **2**¹: 429; Man. R. M. 261]; *Eritrichium glomeratum* DC. Prod. **10**: 131.

On dry hills, at an altitude of 1000–2500 m.

MONTANA: Helena, 1889, *F. D. Kelsey*; *Wyeth* (?); Beaver Head Co., 1888, *F. Tweedy*, *81*; Livingston, 1886, *1172*; Bozeman, 1882: 1887, *218*; Cottonwood Creek, 1896, *Flodman*, *748*; Pony, July 8, 1897, *Rydberg & Bessey*, *4882*; Spanish Basin, June 23, *4883*; Great Falls, 1887, *R. S. Williams*, *109*; Gallatin Co., *Mrs. Alderson*; Custer Co., 1892, *Mrs. Light*; Fort Benton, *John Pearsall*, *907*; *F. W. Traphagen*; Shields River, 1883, *Canby*, *174*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall*; Mammoth Hot Springs, 1885, *F. Tweedy*, *816*, in part.

Oreocarya sericea (Gray) Greene, Pittonia, **1**: 58 [Ill. Fl. **1**: 58]; *Eritrichium glomeratum humile* Gray, Proc. Am. Acad. **10**: 61 [Syn. Fl. **2**¹: 196]; *Krynitzkia sericea* Gray, Proc. Am. Acad. **20**: 279 [Syn. Fl. **2**¹: 430; Man. R. M. 261].

MONTANA: Lima, 1895, *Rydberg, 2776;* Madison Co., *Mrs. McNulty;* Gallatin Co., *Mrs. Alderson;* Shinberger's Cañon, 1880, *Watson.*

Myosotis alpestris Schmidt, Fl. Boehm. 3: 26: *Myosotis sylvatica alpestris* Koch, Syn. Fl. Ger. 505 [Syn. Fl. 2^1: 202; Bot. Cal. 1: 522; Man. R. M. 263]; *M. rupicola* Smith, Eng. Bot. *2559.*

Among rocks and in alpine meadows, at an altitude of 2000–3000 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 80;* Bozeman, 1885, *805;* Lima, 1895, *Rydberg, 2776* (alpine form); Spanish Basin and Peaks, 1896, *Flodman, 749* and *750;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4877* (alpine form); Bridger Mts., June 11, *4878;* Electric Peak, August 18, *4879;* Livingston, 1891, *A. R. Joy;* Lake Plateau, 1897, *P. Koch, 49;* Upper Marias Pass and Mystic Lake, Bozeman, 1883, *Canby, 245;* Sixteen Mile Creek, 1883, *Scribner, 177.*

YELLOWSTONE PARK: Mt. Holmes, 1884, *F. Tweedy, 196* (alpine form).

Onosmodium molle Michx. Fl. Bor. Am. 1: 133 [Ill. Fl. 3: 66]; *Onosmodium Carolinianum molle* Gray, Syn. Fl. 2^1: 206 [Man. R. M. 264.]

MONTANA: *John Pearsall, 814:* Lower Falls of Missouri, 1886, *R. S. Williams, 399.*

* Lithospermum lanceolatum.

Perennial, erect, strict, branching above, 3–5 dm. high: stem striate, strigose and slightly hispid; leaves lanceolate, 4–10 cm. long, 6–12 mm. wide, the lower long-acuminate, the upper acute or obtuse, finely strigose, with a strong midrib, firm; margin entire and ciliate; inflorescence open; flowers nearly sessile in the axils of the leaf-like bracts; calyx yellowish hispid: sepals linear-lanceolate, about 5 mm. long; corolla yellow, the tube about 7 mm. long, the limb 5–7 mm. wide; nutlets broadly ovoid, white, shining, pointed, 5–6 mm. long, 4 mm. in diameter.

Nearest related to *L. pilosum*, differing in the broader leaves, the open inflorescence, smaller flowers, larger nutlets and less hispidity. In *L. pilosum* all the leaves, except the floral ones, are linear and the stem is very hispid.

IDAHO: Lewiston, 1896, *A. A.* and *E. Gertrude Heller, 3092* (type).

WASHINGTON: Pullman, 1893, *C. V. Piper.*

YELLOWSTONE PARK: Snake River Valley, 1872, *J. M. Coulter.*

MONTANA: Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 4862a.*

NEVADA: Unionville, 1868, *Watson, 839*, in part.

CALIFORNIA: Washoe Valley, 1865, *Stretch.*

Lithospermum pilosum Nutt. Journ. Acad. Sci. Phila. **7**: 43 [Ill. Fl. **3**: 64; Syn. Fl. **2**¹: 204; Bot. Cal. **1**: 522: Man. R. M. 263].

In cañons and on hillsides, at an altitude of 1500–2500 m.

MONTANA: Helena, 1888, *F. D. Kelsey;* Hell Gate, *John Pearsall, 85* and *872;* Bozeman, 1887, *F. Tweedy, 221;* Bridger Mountains, June 11, 1897, *Rydberg & Bessey, 4863;* Helena, 1892, *F. D. Kelsey;* Gallatin Co., *Mrs. Alderson;* 1892, *W. T. Shaw;* Bozeman, 1883, *Scribner, 178.*

YELLOWSTONE PARK: *Dr. Chas. H. Hall,* 1888; Mammoth Hot Springs, 1885, *F. Tweedy, 810.*

* **Lithospermum Torreyi** Nutt. Journ. Acad. Sci. Phila. **7**: 44.

Like *L. pilosum*, but taller, grayish-strigose, scarcely at all hirsute and with smaller paler flowers. In cañons, up to an altitude of 2000–2500 m.

MONTANA: *Wyeth;* Spanish Basin, 1896, *Flodman, 753.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4862.*

Lithospermum Gmelini (Michx.) Hitchcock, Spring Fl. Manh. 30 [Ill. Fl. **3**: 65]; *Batschia Caroliniensis* Gmel. Syst. **1**: 315; not *Lithospermum Carolinianum* Lam.; *Batschia Gmelini* Michx. Fl. Bor. Am. **1**: 130; *L. hirtum* Lehm. Asp. 304 [Syst. Fl. **2**¹: 205; Man. R. M. 264].

Dry prairies and plains, up to an attitude of 2500 m.

MONTANA: *John Pearsall, 858.*

YELLOWSTONE PARK; 1883, *Miss Mary Compton.*

Lithospermum linearifolium Goldie, Edinb. Phil. Journ. **1822**: 322. 1822; *Lithospermum angustifolium* Michx. Fl. Bor. Am. **1**: 130. 1803 [Ill. Fl. **3**: 65; Syn. Fl. **2**¹: 205; Man. R. M. 264]; not Forsk. 1775; *Batschia longiflora* Pursh, Fl. Am. Sept. 132. 1814; *L. longiflorum* Spreng. Syst. **1**: 544. 1825; not Salisb. 1796.

Dry plains, up to an altitude of 2500 m.

MONTANA: Fort Benton, *John Pearsall;* Helena, 1889, *F. D. Kelsey;* Madison Co., 1888, *F. Tweedy, 83;* Bozeman, 1885, *809;*

Middle Sand Coulee, 1888, *R. S. Williams, 298;* Salesville, 1892, *W. T. Shaw;* Madison Co., *Mrs. McNulty;* Madison River, 1883, *Scribner, 179.*

YELLOWSTONE PARK: *Dr. Chas. H. Hall*, 1888.

Mertensia Sibirica (L.) Don, Gen. Syst. **4**: 319 [Syn. Fl. **2**^{1}: 200; Bot. Cal. **1**: 523; Man. R. M. 262]; *Pulmonaria Sibirica* L. Sp. Pl. 135.

Along streams, up to an altitude of 2500 m.

MONTANA: Bridger Mts., June 18, 1897, *Rydberg & Bessey, 4875;* Spanish Basin, July 24, *4876;* Indian Creek, July 21, *4872;* Deer Lodge, 1892, *W. T. Shaw;* Silver Bow Co., *Mrs. Moore;* Lewis and Clarke Co., *Mrs. Muth;* Jefferson City, 1883, *Scribner, 175.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall.*

***Mertensia ciliata** Don, Gen. Syst. **4**: 372; *Pulmonaria ciliata* James; Torr. Ann. Lyc. N. Y. **2**: 224.

This has been confounded with the preceding, but differs in the very short rounded calyx-lobes, those of *M. Sibirica* being linear-oblong. Along streams, up to an altitude of 2500 m.

MONTANA: Helena, 1889, *F. D. Kelsey* (white-flowered); Park Co., 1887, *F. Tweedy, 214;* 1888, *811*; Lima, 1895, *Rydberg, 2777;* Spanish Basin, 1896, *Flodman, 751.*

YELLOWSTONE PARK: 1884, *F. Tweedy.*

* Mertensia intermedia.

Perennial, with a short erect rootstock; stem 3–4 dm. high, glabrous, slightly striate, strict and simple; lower leaves oblanceolate, obtuse, about 1 dm. long, the blade tapering into a winged petiole, minutely scabrous and with scabrous-ciliate margin; upper leaves oblong or lanceolate, subsessile; panicle with few branches; calyx divided three-fourths its length, 3–4 mm. long, enlarging in fruit, often 8 mm. long, hispid-ciliate; corolla-tube 8–10 mm. long, three to four times as long as the calyx, and longer than the limb, which is 5–8 mm. long and 8–10 mm. wide; nutlets about 3 mm. high, alveolar and white-spotted.

In the size and form of the corolla it stands nearest to *M. Sibirica* and *M. paniculata;* it has the sepals of the latter. The leaves, however, are different; they are not ovate as in those species, but oblanceolate or lanceolate as in *M. lanceolata* and *M. Drummondii,* from which it differs in the taller habit and much longer corolla-tube. Grows in rich soil, on hillsides, at an altitude of 2000 m.

MONTANA: Bridger Mountains, June 17–18, 1897, *Rydberg & Bessey, 4873* and *4874*.

Mertensia paniculata (Ait.) Don, Gen. Syst. **4**: 318 [Ill. Fl. **3**: 60; Syn. Fl. **2**^{1}: 201; Man. R. M. 262]; *Pulmonaria paniculata* Ait. Hort. Kew. **1**: 181.

Along streams, up to an altitude of 2500 m.

MONTANA: Electric Peak, August 18, 1897, *Rydberg & Bessey, 4864*.

Mertensia nivalis (Wats.); *Mertensia paniculata nivalis* Wats. King's Exped. **5**: 239 [Syn. Fl. **2**^{1}: 201].

This is evidently not related to *M. paniculata*, lacking the leaves as well as the sepals of that species. In the size of the plant and general habit it resembles closely *M. lanceolata*, but differs from that plant in the longer corolla-tube and the narrower linear sepals. It is a subalpine plant, growing at an altitude of 2300 m.

MONTANA: Wolf Butte, 1892, *R. S. Williams, 130;* Bozeman Pass, 1883, *Scribner, 176*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4865*.

Mertensia lanceolata (Pursh) DC. Prod. **10**: 88 [Ill. Fl. **3**: 60; Syn. Fl. **2**^{1}: 201; Man. R. M. 262]: *Pulmonaria lanceolata* Pursh, Fl. Am. Sept. 729.

Subalpine hillsides, in wet places, at an altitude of 2000–2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 752* and *754;* Bridger Mountains, June 15, 1897, *Rydberg & Bessey, 4870;* Cedar Mountain, July 16, *4871;* Madison Co., *Mrs. Flora McNulty;* Upper Marias Pass, 1883, *Canby, 244*.

Mertensia oblongifolia Don, Gen. **4**: 372 [Syn. Fl. **2**^{1}: 200: Man. R. M. 262]; *Pulmonaria oblongifolia* Nutt. Journ. Acad. Nat. Sci. Phila. **7**: 43.

In wet places, on subalpine hills, at an altitude of 2000–3000 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 84;* Deer Lodge, 1888, *F. W. Traphagen;* Helena, 1883, *F. Tweedy;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 4868;* Old Hollowtop, July 9, 1897, *4869;* Helena, 1891, *F. D. Kelsey;* Deer Lodge, 1892, *W. T. Shaw*.

* Mertensia Tweedyi.

Low and tufted, glabrous and rather fleshy; stems decumbent or seldom ascending, often less than 1 cm. long; leaves minutely papillose above, smooth beneath; basal leaves oblong, oblanceolate or spatulate, somewhat fleshy, obtuse or acutish, the petioles 2–4 cm. long; stem leaves 1–2 cm. long, oblong-lanceolate, acutish; calyx divided nearly to the base, its lobes linear-lanceolate, ciliate on the margin, one-half to one-third the length of the tube of the corolla; corolla dark blue, 8–10 mm. long, its limb fully as long as the tube, 6–8 mm. in diameter; stamens included in the throat of the corolla, the filaments very short; style short, reaching about to the middle of the anthers.

This has been included in *M. alpina*, which, without doubt, contains several species. Of these, *M. brevistyla* Wats. is one. The typical *M. alpina*, represented by the original specimens collected by James in the Long Expedition, is upright, and has ovate stem-leaves and a much smaller corolla-limb. As far as can be judged from the dry specimens, the plant is not fleshy. Found on the highest peaks of southern Montana, northwestern Wyoming and adjacent Idaho.

MONTANA: Old Hollowtop, Pony Mountains, July 7–9, 1897, *Rydberg & Bessey*, *4867* (type); Indian Creek, July 22, *4866;* Lake Plateau, 1897, *P. Koch*, *34* and *60;* Sheep Mountain, 1887, *Tweedy*, *215*.

YELLOWSTONE PARK: Mt. Holmes, 1884, *F. Tweedy*, *192;* Hoodoo Peak, 1897, *P. Koch*, *17*.

VERBENACEAE.

Verbena hastata L. Sp. Pl. 20 [Ill. Fl. **3**: 70: Syn. Fl. **2**[1]: 336; Bot. Cal. **1**: 609; Man. R. M. 291].

In meadows, up to an altitude of 1500 m.

MONTANA: Falls of Missouri, 1885, *F. W. Anderson;* Bozeman, 1887, *P. Koch;* Great Falls, 1887, *R. S. Williams*, *692*.

Verbena bracteosa Michx. Fl. Bor. Am. **2**: 13 [Ill. Fl. **3**: 71; Syn. Fl. **2**[1]: 336; Bot. Cal. **1**: 609; Man. R. M. 291].

On prairies, up to an altitude of 1500 m.

MONTANA: Great Falls, 1886, *R. S. Williams*, *60;* Gallatin Co., *Mrs. Alderson;* Indian Creek, 1883, *Scribner*, *209*.

LABIATAE.

* Mentha rubella.

Stems from a slender stoloniferous rootstock, about 1 dm. high, 4-angled, more or less purple, finely puberulent with short white somewhat crisped hairs; leaves ovate, 1–2 cm. long, more or less purple-tinged, finely puberulent and glandular-punctate, finely serrate, acute and short-petioled; flowers verticillate in the axils of all the leaves, except the lowermost; calyx 2–3 mm. long, puberulent, its lobes triangular-lanceolate, acuminate; corolla 5–6 mm. long and 3 mm. in diameter, light rose; stamens nearly twice as long as the corolla.

Nearest related to *M. Canadensis*, but differs in the small size, the reddish-purple color of the larger part of the plant, the short-petioled leaves, the pubescence, and the fact that even the uppermost leaves have verticils in their axils.

YELLOWSTONE PARK: On the hot springs formation, near a hot water stream, in the lower Geyser Basin, August 4, 1897, *Rydberg & Bessey, 4900.*

Mentha Canadensis L. Sp. Pl. 577 [Ill. Fl. **3**: 122; Syn. Fl. **2**^{1}: 352; Bot. Cal. **1**: 591: Man. R. M. 294].

In wet places, up to an altitude of 2500 m.

MONTANA: East Gallatin Swamps, 1896, *Flodman, 755;* Sand Coulee, 1885, *R. S. Williams, 320:* Silver Bow Co., *Mrs. Moore;* Bozeman, 1892, *W. T. Shaw;* Sheep Creek, 1883, *Scribner, 210.*

YELLOWSTONE PARK: 1884, *Tweedy, 107.*

Lycopus lucidus Turcz.: Benth. in DC. Prod. **12**: 178 [Ill. Fl. **3**: 118]; *Lycopus lucidus Americanus* Gray, Proc. Am. Acad. **8**: 286 [Syn. Fl. **2**^{1}: 353: Bot. Cal. **1**: 592; Man. R. M. 295].

In wooded swamp-lands, up to an altitude of 1500 m.

MONTANA: Little Rocky Mts., 1889, *Dr. V. Havard;* Great Falls, 1886, *R. S. Williams, 380;* Gallatin City, 1882, *Canby.*

Lycopus Americanus Muhl.: Bart. Fl. Phila. Prod. 15 [Ill. Fl. **3**: 117]; *Lycopus sinuatus* Ell. Bot. S. C. & Ga. **1**: 26 [Syn. Fl. **2**^{1}: 353; Bot. Cal. **1**: 292: Man. R. M. 295].

In wet places and shaded swamps, up to an altitude of 2000 m.

MONTANA: Belt River, 1883, *T. W. Anderson;* Great Falls, 1886, *R. S. Williams, 381.*

Lycopus Virginicus L. Sp. Pl. 21 [Ill. Fl. **3**: 116; Man. R. M. 294; Syn. Fl. **2**^{1}: 353].

In shaded swamps, up to an altitude of about 2500 m.

YELLOWSTONE PARK: Yellowstone Lake, 1885, *Tweedy, 429.*

Hedeoma hispida Pursh, Fl. Am. Sept. 414 [Ill. Fl. **3**: 106; Syn. Fl. **2**^{1}: 362; Man. R. M. 296].

In loose soil and waste places, up to an altitude of 1500 m.

MONTANA: Bozeman, 1884, *Tweedy, 104;* Sand Coulee, 1885; *R. S. Williams, 322*; Silver Bow Co., *Mrs. Moore.*

Hedeoma Drummondii Benth. Lab. Gen. & Sp. 368 [Ill. Fl. **3**: 106; Syn. Fl. **2**^{1}: 362; Man. R. M. 296].

On dry hills and plains, up to an altitude of 1500 m.

MONTANA: Livingston, 1886, *Tweedy, 1076; F. W. Anderson;* Great Falls, 1885, *R. S. Williams, 318;* Silver Bow Co., *Mrs. Moore;* Gallatin, 1882, *Canby;* Pole Creek, 1897, *Rydberg & Bessey.*

Salvia lanceolata Willd. Enum. 37 [Ill. Fl. **3**: 100; Syn. Fl. **2**^{1}: 369; Man. R. M. 296].

On dry prairies, up to an altitude of 2000 m.

MONTANA: Helena, 1889, *Kelsey.*

Monarda scabra Beck, Am. Journ. Sci. **10**: 260 [Ill. Fl. **3**: 103]; *Monarda fistulosa mollis* Benth. Lab. Gen. & Sp. 317, in part [Syn. Fl. **2**^{1}: 374; Man. R. M. 297].

Among bushes in the valleys, up to an altitude of 2000 m.

MONTANA: Gallatin Co., 1887, *Tweedy, 240;* Little Rocky Mts., 1889, *Dr. V. Havard;* Bozeman, 1887, *Tweedy, 240;* 1884, *105;* East Gallatin Swamps, 1896, *Flodman, 756;* Pony, July 6, 1897, *Rydberg & Bessey, 4901;* Sand Coulee, 1885, *R. S. Williams;* Helena, 1894, *E. Douglas;* Cottonwood Creek, 1892, *W. T. Shaw;* Gallatin Co., *Mrs. Hodgman;* Madison Valley, 1871, *Hayden Survey;* Swimming Women Creek, 1882, *Canby.*

Agastache urticifolia (Benth.): *Lophanthus urticifolia* Benth. Bot. Reg. **15**: *1282* [Syn. Fl. **2**^{1}: 376; Bot. Cal. **1**: 602; Man. R. M. 298]; *Vleckia urticifolia* Holzinger, Contr. U. S. Nat. Herb. **3**: 246.

In rich valleys, at an altitude of 1500–2000 m.

MONTANA: Middle Creek, 1886, *Tweedy, 1079;* Bozeman, 1895, *Rydberg, 2778;* Spanish Basin, 1896, *Flodman, 757;* Spanish Basin, June 25–28, 1897, *Rydberg & Bessey, 4904;* Gate of the Mountains, 1891, *F. D. Kelsey;* Madison Co., *Mrs. McNulty;* Salesville, 1892, *W. T. Shaw;* Bear Creek Cañon, *Shaw;* Helena, 1894, *E. Douglas;* Sixteen Mile Creek, 1883, *Scribner, 212.*

* **Nepeta Cataria** L. Sp. Pl. 570 [Ill. Fl. **3**: 86; Syn. Fl. **2**^{1}: 377].

The Catmint sometimes escapes from cultivation.

MONTANA: Helena, 1892, *Kelsey;* Bonner, 1892, *Sandberg, McDougal & Heller, 983.*

Dracocephalum parviflorum Nutt. Gen. **2**: 35 [Ill. Fl. **3**: 87; Syn. Fl. **2**¹: 378; Man. R. M. 298].

In rich valleys, especially among bushes, at an attitude of 1500–2500 m.

MONTANA: Bozeman, 1887, *Tweedy, 241;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 4903;* Helena, 1891, *Kelsey;* Highwood Creek, 1888, *R. S. Williams;* Jefferson City, 1883, *Scribner, 215.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 106;* Hot Sulphur Springs, 1871, *Hayden Survey.*

Scutellaria galericulata L. Sp. Pl. 599 [Ill. Fl. **3**: 83; Syn. Fl. **2**¹: 381; Bot. Cal. **1**: 603; Man. R. M. 298].

Along streams, up to an altitude of 2000 m.

MONTANA: Bozeman, 1886, *Tweedy, 1078;* East Gallatin Swamps, 1896, *Flodman, 758;* Great Falls, 1886, *R. S. Williams;* Helena, 1890, *Kelsey;* Little Prickly Pear Creek, 1883, *Scribner, 216.*

* **Scutellaria siphocampyloides** Vatke, Bot. Zeit. **30**: 717; *Scutellaria angustifolia canescens* Gray, Bot. Cal. **1**: 603 [Syn. Fl. **2**¹: 381].

A tomentulose-canescent plant, resembling *S. angustifolia* Pursh, but with shorter and broader leaves and erect corolla. From *S. resinosa* it is easily distinguished by the oblong leaves.

MONTANA: Horse Plains, 1883, *H. B. Ayres, 2a.*

Physostegia parviflora Nutt.; Benth. in DC. Prod. **12**: 434 [Syn. Fl. **2**¹: 383; Man. R. M. 299].

River banks and prairies among bushes, up to an altitude of 200 m.

MONTANA: Big Hole Creek, 1888, *Tweedy, 41;* Deer Lodge, 1895, *Rydberg, 2779;* Great Falls, 1890, *R. S. Williams, 213;* Centerville, 1883, *Scribner, 214.*

* **Prunella vulgaris** L. Sp. Pl. 600 [Ill. Fl. **3**: 88; Syn. Fl. **2**¹: 382; Bot. Cal. **1**: 604].

A low plant with oblong petioled leaves, reddish purple flowers and conspicuous truncate calyx-lobes. Valleys, up to an altitude of 2500 m.

MONTANA: Spanish Basin, June 30, 1897, *Rydberg & Bessey, 4902;* Gallatin Co., *Mrs. Alderson;* Lewis and Clarke Co., *Mrs.*

Muth; Helena, 1894, *E. Douglas;* Cottonwood Creek, 1892, *W. T. Shaw.*

YELLOWSTONE PARK: Yellowstone Lake, 1884, *Tweedy, 108;* Mud Spring, 1871, *Hayden Survey.*

Stachys palustris L. Sp. Pl. 580 [Ill. Fl. **3**: 97; Syn. Fl. **2**¹: 387; Man. R. M. 291].

Wet meadows, up to an altitude of 2000 m.

MONTANA: Deer Lodge, 1889, *F. W. Traphagen;* Bozeman, 1886, *Tweedy, 1077;* East Gallatin Swamps, 1896, *Flodman, 759;* Hilger's, 1892, *Kelsey;* West Gallatin, 1892, *W. T. Shaw;* Silver Bow Co., *Mrs. Moore;* Sixteen Mile Creek, 1883, *Scribner, 217.*

SOLANACEAE.

Physalis longifolia Nutt. Trans. Am. Phil. Soc. II., **5**: 193 [Ill. Fl. **3**: 129; Rydb. Mem. Torr. Bot. Club, **4**: 338]; *Physalis lanceolata laevigata* Gray, Proc. Am. Acad. **10**: 68 [Syn. Fl. **2**¹: 237; Man. R. M. 270].

On dry prairies and plains, up to an altitude of 1500 m.

MONTANA: Stillwater, 1889, *Tweedy, 6;* Sand Coulee, 1885, *R. S. Williams, 295.*

Physalis Virginiana Mill. Gard. Dict. Ed. 8, No. 4 [Ill. Fl. **3**: 130; Rydb. Mem. Torr. Bot. Club, **4**: 343]; *Physalis lanceolata* R. & S. Syst. Veg. **4**: 673 [Syn. Fl. **2**¹: 236, mainly; Man. R. M. 270]; not Nutt.

On prairies, up to an altitude of 2000 m.

MONTANA: Helena, *Kelsey.*

Nicotiana attenuata Torr.; Wats. King's Exped. **5**: 276 [Syn. Fl. **2**¹: 243; Bot. Cal. **1**: 545; Man. R. M. 271].

In valleys, up to an altitude of 2000 m.

MONTANA: Cinnabar, 1887, *Tweedy, 147;* 1888, *F. W. Anderson.*

Solanum triflorum Nutt. Gen. **1**: 128 [Ill. Fl. **3**: 135; Syn. Fl. **2**¹: 227; Man. R. M. 268].

In loose soil, as in "prairie-dog towns" and cultivated ground, up to an altitude of 2000 m.

MONTANA: Madison River, 1886, *Tweedy;* Bozeman, 1884, *Tweedy;* Yellowstone River, near Fridley, August 22, 1897, *Rydberg & Bessey, 4905;* Great Falls, 1891, *R. S. Williams, 406;* Cottonwood Creek, 1892, *W. T. Shaw.*

Solanum rostratum Dunal, Sol. 234 [Ill. Fl. 3: 136; Syn. Fl. 2^1: 231; Bot. Cal. 1: 538; Man. R. M. 269].

MONTANA: Helena, 1892, *Annie Brooke;* Custer County, 1892, *Mrs. J. E. Light.*

SCROPHULARIACEAE.

* **Verbascum Thapsus** L. Sp. Pl. 177 [Ill. Fl. 3: 143; Syn. Fl. 2^1: 250].

A tall densely woolly plant, 1–2 m. high, with a long dense spike of yellow flowers having five stamens. It is sparingly introduced from Europe.

MONTANA: Fort Logan, 1892, *E. N. Brandegee.*

Pentstemon fruticosus (Pursh) Greene, Pittonia, 2: 239; *Gerardia fruticosa* Pursh, Fl. Am. Sept. 2: 423; *Pentstemon Menziesii* Hook. Fl. Bor. Am. 2: 98, in part [Syn. Fl. 2^1: 259; Bot. Cal. 1: 556; Man. R. M. 274].

The figure in Pursh's Flora shows that the original of *Gerardia fruticosa* is the rather rare species with obovate sharply-toothed leaves. Of this I have seen only the following specimen from our region:

MONTANA: Lake Terry, 1892, *R. S. Williams, 891.*

* **Pentstemon crassifolius** Lindl. Bot. Reg. 24: *16; Pentstemon Menziesii Douglasii* Gray, Proc. Am. Acad. 6: 56, in part [Syn. Fl. 2^1: 260]; not *P. Douglasii* Hook.

Differs from the preceding in the oblanceolate or oblong entire leaves. It is common in the valleys, at an altitude of 1500–3000 m.

MONTANA: Granite, 1892, *F. D. Kelsey:* Spanish Basin, 1896, *Flodman, 760* and *761;* Old Hollowtop, Pony Mts., July 9, 1897, *Rydberg & Bessey, 4906;* Emigrant Gulch, *4949;* Helena, 1891, *Kelsey;* Deer Lodge Co., *Emma J. Ware;* Madison Co., *Mrs. L. A. Fitch.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Slough Creek, 1885, *Tweedy, 867* (flowers violet-purple); 1883, *Mary Compton.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4907.*

* **Pentstemon Scouleri** Dougl.; Lindl. Bot. Reg. *1277; Pentstemon Menziesii Scouleri* Gray, Proc. Am. Acad. 6: 56 [Syn. Fl. 2^1: 260].

Similar to the preceding, but with narrow lanceolate leaves which are sparsely and acutely serrate. At an altitude of 2500 m.

YELLOWSTONE PARK: 1873, *C. C. Parry, 205.*

* **Pentstemon Lyallii** Gray, Syn. Fl. 2^1: 440; *Pentstemon Menziesii Lyallii* Gray, Proc. Am. Acad. 6: 26.

Differs from the three preceding in the long corolla which is 3.5–4 cm. long, fewer flowers, and longer thinner sharply serrate leaves. Rare, growing only in the western portion of the state.

MONTANA: Missoula Cañon, 1880, *Watson;* northwestern Montana, 1861, *Lyall;* Missoula, *Mrs. J. J. Kennedy;* Jocko River, 1883, *Canby*, *248*.

* **Pentstemon ellipticus** Coulter & Fisher, Bot. Gaz. **18**: 302.

Characterized by its low cespitose habit, 1–3-flowered flower-cluster, and small oval serrate leaves, which are not coriaceous as they are in the other species of the group.

MONTANA: McDonald's Peak, 1883, *Canby*, *247*.

* **Pentstemon montanus** Greene, Pittonia, **2**: 240.

Perhaps somewhat related to the five preceding species, but the stems are not woody, except the perennial caudex, and with rather fleshy, not leathery, sharply serrate ovate leaves. Mountain sides, at an altitude of 2000–3000 m.

MONTANA: Mystic Lake, 1895, *Rydberg*, *2781*.

YELLOWSTONE PARK: Mt. Holmes, 1884, *F. Tweedy*, *51:* Mt. Norris, 1885, *866* (type); Electric Peak, Aug. 18, 1897, *Rydberg & Bessey*, *4909:* 1873, *C. C. Parry*, *204*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *4908*.

Pentstemon Fremontii Torr. & Gray, Proc. Am. Acad. **6**: 60 [Syn. Fl. 2^1: 262; Bot. Cal. **1**: 622; Man. R. M. 274].

In the mountain regions, at an altitude of about 2000 m.

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy*, *861*.

***Pentstemon Brandegei** Porter.

Pentstemon cyananthus Brandegei Porter Syn. Fl. Colo. 91.

Stem tall, 3–5 dm. high, terete, glabrous or minutely puberulent, strict, light-colored; basal leaves 5–8 cm. long, oblong, petioled, entire, glaucous, glabrous, or puberulent under the lens; lower stem-leaves lanceolate, the upper ones ovate-cordate, sessile or somewhat clasping, 3–7 cm. long and 2–3 cm. wide; bracts lanceolate, 1–2 cm. long; calyx 4–5 mm. long, its lobes short, broadly rhomboid or cuneate, broadly scarious-margined and cut-toothed, short-acuminate; corolla dark blue, about 3 cm. long, obliquely funnelform, only slightly gibbous on the lower side; lip slightly bearded inside; sterile stamen club-shaped, almost glabrous.

Nearest related to *P. cyananthus*, differing mainly in the short calyx and the broad and strongly scarious calyx-lobes. The following specimens are in the herbarium of the College of Pharmacy, New York.

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy*, *52.*

COLORADO: Sierra Majado, 1874, *T. S. Brandegee* (type).

Pentstemon cyananthus Hook. Bot. Mag. *4464; Pentstemon glaber cyananthus* Gray, Proc. Am. Acad. 6: 60 [Syn. Fl. 2¹: 263; Man. R. M. 275].

Characterized by its subcordate stem-leaves and long-acuminate calyx-lobes. At an altitude of about 2000 m.

MONTANA: Pleasant Valley, 1871, *G. N. Allen* (Hayden Survey).

* **Pentstemon glaber speciosus** (Dougl.); *P. speciosus* Dougl. in Lindl. Bot. Reg. *1720.*

Taller and more slender than the species, the inflorescence more lax, and the upper leaves much diminished. Mountain sides, at an altitude of 2000–3000 m.

MONTANA: Cliff Lake, July 27, 1897, *Rydberg & Bessey*, *4911.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1894, *T. H. Burglehaus;* 1888, *Dr. Chas. H. Hall;* 1884, *Tweedy*, *52;* 1885, *863.*

IDAHO: Mount Chauvet, July 29, 1897, *Rydberg & Bessey*, *4912* and *4913* (the latter a monstrosity with polypetalous corolla).

Pentstemon acuminatus Dougl.; Lindl. Bot. Reg. *1285* [Ill. Fl. 3: 154; Syn. Fl. 2¹: 263; Bot. Cal. 1: 559: Man. R. M. 275].

Dry hills and plains, up to an altitude of 2000 m.

MONTANA: Beaver Head Co., 1888, *Tweedy*, *71;* Deer Lodge, 1888, *F. W. Traphagen;* Great Falls, 1886, *R. S. Williams;* Gallatin Co., *Mrs. Mary L. Alderson;* Bozeman, 1892, *W. T. Shaw;* Custer Co., *Mrs. Light;* Bozeman, 1883, *Scribner*, *184.*

* Pentstemon saliens.

Stems 2–4 from a perennial root, 2–3 dm. high, finely puberulent, terete, often tinged with brown; basal leaves obovate, about 5 cm. long, entire or somewhat toothed, light green and rather firm; stem-leaves opposite, oblanceolate, oblong or lanceolate, the lower with winged petioles, the upper sessile, all firm, light green, entire at the base, the upper part dentate with salient sharp teeth;

calyx about 1 cm. long, villous-viscid, divided almost to the base; lobes linear-lanceolate, acuminate; corolla about 2 cm. long, reddish, puberulent, obliquely funnelform, gibbous on the lower side near the throat; limb over 15 mm. wide; lower lip inside and the sterile stamen bearded with long yellow hairs which are club-shaped and curved at the apex.

In the general habit and the size and form of the flower this suggests *P. Jamesii* and *P. cristatus*, but is apparently not related very closely to either. It is easily distinguished by the saliently toothed leaves. In the western part of the state, at a low altitude.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy*, *53*.

* **Pentstemon ovatus** Dougl.; Hook. Bot. Mag. *2903* [Syn. Fl. **2**^{1}: 266].

Characterized by its ovate sharply serrate bright-green leaves, and the purple-blue corolla which is bearded in the throat. On wooded banks.

MONTANA: Ross' Hole, 1880, *Watson*.

Pentstemon secundiflorus Benth.; DC. Prod. **10**: 325 [Syn. Fl. **2**^{1}: 263; Man. R. M. 275].

At an altitude of about 2500 m.

YELLOWSTONE PARK: 1873, *C. C. Parry*, *209*.

Pentstemon cristatus Nutt. Gen. **2**: 52 [Ill. Fl. **3**: 151; Syn. Fl. **2**^{1}: 266; Man. R. M. 276].

Hillsides, up to an altitude of 2500 m.

MONTANA: Helena, 1888, *F. D. Kelsey;* Upper Missouri, 1889, *Dr. V. Havard;* Deer Lodge, 1888, *F. W. Traphagen;* Madison Co., 1888, *Tweedy*, *75;* Bridger Mts., June 11, 1897, *Rydberg & Bessey*, *4914;* Great Falls, 1892, *R. S. Williams*, *126;* Gallatin Co., *Mrs. Mary L. Alderson;* Bozeman, 1883, *Canby*, *249;* Shields River, 1883, *Scribner*, *185*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall*, Mammoth Hot Springs, 1887, *Tweedy*, *865;* Stinking Water Creek, 1871, *Robert Adams* (Hayden Survey).

Pentstemon albidus Nutt. Gen. **2**: 53 [Ill. Fl. **3**: 152; Syn. Fl. **2**^{1}: 266; Man. R. M. 276].

On sandy plains, up to an altitude of 1500 m.

MONTANA: *R. S. Williams*.

* **Pentstemon confertus** Dougl.; Lindl. Bot. Reg. *1260* [Syn. Fl. **2**^{1}: 267; Bot. Cal. **1**: 560].

Taller than *P. procerus* and with ochroleucous or sulphur-yellow flowers. Moist ground, up to an altitude of 2000 m.

MONTANA: Helena, *F. D. Kelsey;* Sun River Cañon, 1887, *R. S. Williams, 697;* Trout Creek, 1891, *815;* 1892, *Miss Emma Ware;* Columbia Falls, *Mrs. J. J. Kennedy, 54;* Big Hole Valley, 1880, *Watson.*

Pentstemon procerus Dougl.; Graham, Edinb. N. Phil. Jour. **1829**: 348; Hook. Bot. Mag. 2954; *Pentstemon confertus coeruleo-purpureus* Gray, Proc. Am. Acad. **6**: 72 [Syn. Fl. **2**^{1}: 267; Bot. Cal. **1**: 560; Man. R. M. 276].

MONTANA: Helena, 1889, *F. D. Kelsey;* Haystack Peak, 1887, *Tweedy, 57;* Little Belt Mts., 1896, *Flodman, 762;* Spanish Basin, *763* and *764;* Bozeman, *765;* Helena, 1891, *F. D. Kelsey;* Silver Bow Co., *Mrs. Jennie H. Moore;* Lake Plateau, 1897, *P. Koch, 33;* Sun River, 1887, *R. S. Williams, 697;* Trout Creek, *815;* Little Belt Mts., 1883, *Scribner, 186;* Beaver Head Co., 1888, *Tweedy, 74* (with short scarious-margined calyx-lobes); Missoula, 1880, *Watson.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 50;* 1883, *Mary Compton.*

* **Pentstemon Rydbergii** A. Nelson, Bull. Torr. Bot. Club, **25**: 281.

Resembles somewhat the preceding, but is a taller plant, about 3 dm. high, with a narrower corolla. In habit it more resembles *P. confertus*, but has a blue, not yellow, corolla. The sepals are scarious-margined.

MONTANA: Plains and valleys near Flathead Lake, 1883, *Canby, 252.*

* **Pentstemon micranthus** Nutt. Journ. Acad. Phila. **7**: 45.

Like the last, but with a still narrower corolla, 8 mm. long, the tube about 2 mm. in diameter, the limb 5 mm. wide; leaves linear or linear-oblanceolate.

MONTANA: Rocky Mountains, *Wyeth.*

* Pentstemon pseudoprocerus.

Perennial with a woody caudex, perfectly smooth up to the glandular-pubescent inflorescence; stems about 2 dm. high, simple; basal leaves spatulate or oblanceolate, 3–5 cm. long, entire; stem-leaves similar or the upper lanceolate, acuminate or acute; inflorescence interrupted-spicate, more or less distinctly verticillate; calyx about 5 mm. long, glandular-pubescent, its lobes short, triangular; corolla fully 1.5 cm. long, dark purplish blue, cylindric-funnelform, slightly oblique, a little gibbous, puberulent; lower lip a little longer than the upper one, with a few long hairs inside; sterile stamen with a spatulate end, densely covered with a yellow beard.

Intermediate between *P. procerus* and *P. humilis*, having the general habit and leaves of the former, but the corolla of the latter. Its flowers are half again longer than those of *P. procerus*, and they are much more open and less bearded within. The stem-leaves are never toothed as in *P. humilis*, and all the leaves are much thicker.

Not uncommon in the mountains, at an altitude of 6000–8000 feet.

MONTANA: Bridger Mountains, June 12, 1897, *Rydberg & Bessey*, *4919* (type); July 11, *4918;* 1896, *Flodman*, *767;* Little Belt Mts., *768;* Beaver Head Co., 1888, *Tweedy*, *74*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy*, *861*.

IDAHO: M. Chauvet, July 29, 1897, *Rydberg & Bessey*, *4917*.

* Pentstemon pseudohumilis.

Perennial, from a branched creeping rootstock, quite glabrous up to the inflorescence; stem 2–3 dm. high, simple; basal leaves broadly spatulate or elliptic, thin but firm, obtuse or acutish, contracted into a slightly winged petiole, with perfectly entire margins; stem-leaves oblanceolate, oblong or lanceolate, mostly all opposite; inflorescence paniculate with short branches, sometimes almost verticillate, more or less glandular-pubescent; calyx glandular-pubescent, 4–6 mm. long, deeply cleft into lanceolate slightly scarious-margined acute or acuminate lobes; corolla bluish purple, slightly pubescent, about 1.5 cm. long, funnelform, slightly oblique, somewhat gibbous; sterile stamen with the spatulate end densely covered with a yellow beard.

Nearest related to *P. humilis* and the preceding. From the former it differs in the leaves which are never toothed, and turn brownish in drying, and in the shorter branches of the inflorescence. It differs from *P. pseudoprocerus* in the thinner and generally broader basal leaves, the longer sepals and the inflorescence which is less like an interrupted spike. Grows on wooded mountain-sides, at an altitude of 2500–3000 m.

MONTANA: Jack Creek, July 15, 1897, *Rydberg & Bessey*, *4916;* Monarch, 1890, *R. S. Williams*, *181*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *4915* (type).

Pentstemon humilis Nutt.; Gray, Proc. Am. Acad. **6**: 69 [Syn. Fl. **2**^{1}: 267; Man. R. M. 277].

On hills and plains, up to an altitude of 2000 m.

MONTANA: Sweet Water Basin, Beaver Head Co., 1888, *Tweedy, 36a;* Bozeman, 1873, *Canby, 251;* Helena, 1890, *Kelsey.*

Pentstemon gracilis Nutt. Gen. **2**: 52 [Ill. Fl. **3**: 153; Syn. Fl. **2**^{1}: 267; Man. R. M. 277].

Dry plains, up to an altitude of 2000 m.

MONTANA: Beaver Head Co., 1888, *Tweedy, 73:* Lima, 1895, *Rydberg, 2780;* Wisconsin Creek, 1892. *H. M. Fitch;* West Gallatin, 1883, *Scribner, 188;* Shinberger's Cañon, 1880, *Watson.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Mammoth Hot Springs, 1885, *Tweedy, 864.*

* **Pentstemon Tweedyi** Canby & Rose, Bot. Gaz. **15**: 66.

A small plant about 1 dm. high, with linear basal-leaves and almost scapose stem with a few-flowered one-sided raceme. Dry hills, at an altitude of about 2000 m.

MONTANA; Beaver Head Co., 1888, *Tweedy, 35.*

* Pentstemon aridus.

Densely cespitose, glabrous, except the glandular-pubescent inflorescence; radical leaves linear, sometimes almost subulate or narrowly oblanceolate, thick and stiff, 2–4 cm. long; stem-leaves generally opposite, about 2 cm. long, usually linear-subulate, erect; flowering stems about 1 dm. high; calyx 5 mm. long, glandular-pubescent, its lobes linear-lanceolate; corolla about 12 mm. long, blue, tubular-funnelform, the lower lip slightly longer than the upper; sterile stamen narrowly linear and glabrous, except the slightly dilated spatulate villous end; cells of the fertile anther divaricate; pod 6–8 mm. long, broadly ovoid.

It is of about the same size as *P. Tweedyi*, which, however, is easily distinguished from it by the broader thinner leaves, almost leafless flowering stems, one-sided inflorescence, and more plainly bilabiate corolla. *P. aridus* more resembles *P. gracilis* in the shape of its smaller corolla, but the whole plant is smaller and has different leaves. It may be mistaken for *P. laricifolius*, which is said to occur in Wyoming.

On dry hillsides, at an altitude of 2000–2500 m.

MONTANA: Spanish Basin, June 23, 1897, *Rydberg & Bessey, 4920* (type); Cedar Mountain, July 16, *4921;* Beaver Head Co., 1888, *Tweedy, 36;* Lima, 1895, *Rydberg, 2782;* Spanish Basin, 1896, *Flodman, 769* and *770;* Anaconda, 1892, *Kelsey;* Willow Creek, 1883, *Scribner, 187.*

Pentstemon glaucus Graham, Edinb. N. Phil. Journn. **1829**: 348 [Syn. Fl. **2**^{1}: 268; Man. R. M. 277].

In the mountains, at high altitudes.

Yellowstone Park: Hoodoo Peak, 1897, *P. Koch, 5.*

Pentstemon pumilus Nutt. Journ. Acad. Sci. Phila. **7**: 46 [Syn. Fl. **2**^{1}: 269; Man. R. M. 278].

A very rare plant from the Rockies.

Montana: Little Goddin River, *Wyeth.*

Pentstemon deustus Dougl. Lindl. Bot. Reg. *1318* [Syn. Fl. **2**^{1}: 269; Bot. Cal. **1**: 559; Man. R. M. 276].

In the mountain regions, up to an altitude of 2500 m.

Montana: Park Co., 1887, *Tweedy, 58;* Horse Plains, 1883, *H. B. Ayres, 4a;* Ross' Hole, 1880, *Watson.*

Yellowstone Park: 1873, *C. C. Parry, 207;* 1888, *Dr. Chas. H. Hall;* Junction Butte, 1885, *Tweedy, 868.*

* Pentstemon diphyllus.

Stem much branched, from a perennial base, minutely puberulent all over and more or less glandular on the upper portion, 2–3 dm. high; leaves opposite, 3–5 cm. long, with short but slender petioles, or the uppermost sessile, lanceolate, acute, sinuately dentate with divergent teeth; inflorescence leafy, paniculate; flowers on very short pedicels, 15–18 mm. long; calyx glandular-pubescent, cleft to near the base into very unequal lobes about 5 mm. long; corolla curved, funnelform; sterile stamen filiform, only slightly thickened at the apex, sparingly bearded.

Nearest related to *P. triphyllus*, and Dr. Gray included in the latter Cooper's rather fragmentary specimens. It is, however, a very distinct species, differing in the more leafy and more branched habit, the broader and opposite leaves, and the narrower and less bearded sterile stamen. Grows in rocky woods.

Montana: Mullen Pass, 1860, *J. G. Cooper;* Soap Gulch, Silver Bow Co., 1888, *Tweedy, 72.*

Collinsia parviflora Dougl.; Lindl. Bot. Reg. *1082* [Syn. Fl. **2**^{1}: 256; Bot. Cal. **1**: 555; Man. R. M. 273].

On mountain-sides, especially in sandy soil, up to an altitude of 2500 m.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Clark's Fork, 1883, *F. Tweedy;* Little Belt Pass, 1896, *Flodman, 775;* Bridger Mts., June 12, 1897, *Rydberg & Bessey, 4922;* Spanish Basin, June 23–28, *4923* and *4924;* Cedar Mountain, July 16, *4925;* Helena, 1890, *F. D. Kelsey;* Deer Lodge Co., *Emma J. Ware;* Bozeman, 1892, *W. T. Shaw;* Jocko River, 1883, *Canby, 246* (unusually tall); Ross' Hole, 1880, *Watson.*

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 887.*

Mimulus Lewisii Pursh, Fl. Am. Sept. 427 [Syn. Fl. **2**^{1}: 276; Bot. Cal. **1**: 566; Man. R. M. 280].

Along streams, up to an altitude of 2500 m.

MONTANA: Jocko River, 1880, *Watson*; Park Co., 1887, *Tweedy, 55;* Spanish Basin, 1896, *Flodman, 771;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 4948;* Twin Bridges, 1891, *Mrs. L. A. Fitch;* Belt Mts., 1890, *R. S. Williams, 188;* Bozeman Cañon, 1897, *H. S. Jennings;* Madison Co., *Mrs. L. A. Fitch;* Upper Marias Pass, 1883, *Canby, 253;* White Sulphur Springs, 1883, *Scribner, 189.*

YELLOWSTONE PARK: 1885, *Tweedy, 873;* East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4947;* Lower Falls, 1871, *Hayden Survey.*

Mimulus Langsdorfii Donn, Bot. Mag., under *pl. 1501: Mimulus luteus* Pursh, Fl. Am. Sept. 426 [Syn. Fl. **2**^{1}: 277; Bot. Cal. **1**: 517; Man. R. M. 280]; not L.

In wet and muddy ground, up to an altitude of 2500 m.

MONTANA: *John Pearsall, 868;* East Boulder, 1887, *Tweedy, 56;* Spanish Basin, 1896, *Flodman, 772;* Bridger Mts., *773;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 4945;* Spanish Basin, July 1, *4946;* Great Falls, 1891, *R. S. Williams, 314;* Bozeman, 1897, *H. S. Jennings;* 1892, *W. T. Shaw;* Madison Co., *Mrs. Flora McNulty;* Boulder Creek, 1883, *Scribner, 190.*

YELLOWSTONE PARK: Yellowstone Lake, 1884, *F. Tweedy, 46* (depauperate); 1888, *Dr. Chas. H. Hall;* 1885, *Tweedy, 874;* Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 4944.*

Mimulus moschatus Dougl.; Lindl. Bot. Reg. *1118* [Ill. Fl. **3**: 159; Syn. Fl. **2**^{1}: 278; Bot. Cal. **1**: 569; Man. R. M. 280].

In springy ground, at an altitude of 1500–2500 m.

MONTANA: Bridger Mts., 1896, *Flodman, 774;* Bozeman, 1892, *Mrs. M. L. Alderson* and *F. D. Kelsey;* Deer Lodge Co., *Emma J. Ware.*

YELLOWSTONE PARK: 1885, *Tweedy, 878;* East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 4942;* Lone Star Geyser, Aug. 7, *4943.*

Mimulus floribundus Dougl.; Lindl. Bot. Reg. *1125* [Syn. Fl. **2**^{1}: 278; Man. R. M. 280; Bot. Cal. **1**: 569].

Wet places, up to an altitude of perhaps 2000 m.

MONTANA: Great Falls, *R. S. Williams;* Bitter Root Valley, 1880, *Watson.*

Mimulus Tolmiei (Benth.); *Eunanus Tolmiei* Benth.; DC. Prod. **10**: 374; *Mimulus nanus* Gray, Proc. Am. Acad. **11**: 96, in part [Syn. Fl. **2**^{1}: 274 and 444; Bot. Cal. **1**: 564; Man. R. M. 279]; not Hook. & Arn.

Two species are generally included in *M. nanus*, in one of which the flowers are scarcely 1 cm. long, not quite half as large as those of the other. This is, however, not the original *M. nanus* and must therefore take the only available name, *M. Tolmiei.* In sandy soil.

YELLOWSTONE PARK: Old Faithful, 1888, *Dr. Chas. H. Hall;* 1873, *Parry, 214;* Upper Geyser Basin, 1884, *Tweedy, 47;* Aug. 6–8, 1897, *Rydberg & Bessey, 494;* Snake River Valley, 1872, *J. M. Coulter.*

Mimulus Breweri (Greene); *Eunanus Breweri* Greene, Bull. Cal. Acad. **1**: 101; *Mimulus rubellus* Gray, Syn. Fl. **2**^{1}: 451, in part [Man. R. M. 279, in part].

More viscid than the true *M. rubellus* and with rose-colored flowers. A plant 2–4 cm. high, growing in sandy soil, at an altitude of about 2500 m.

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 875* and *876.*

* **Mimulus Suksdorfii** Gray, Syn. Fl. **2**^{1}: 450.

Like the last, but with larger yellowish corolla and oblong lanceolate leaves. In sandy soil.

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 877.*

* **Monniera rotundifolia** Michx. Fl. Bor. Am. **2**: 22 [Ill. Fl. **3**: 161]; *Herpestis rotundifolia* Pursh, Fl. Am. Sept. 418 [Syn. Fl. **2**^{1}: 280].

On muddy shores and in shallow water, up to an altitude of 1000

m. A small plant with orbicular or broadly obovate sessile opposite leaves, and small blue flowers.

Montana: Lower Sand Coulee, 1891, *R. S. Williams, 856.*

Gratiola Virginica L. Sp. Pl. 17 [Ill. Fl. **3**: 161; Syn. Fl. **2**^{1}: 281; Bot. Cal. **1**: 570; Man. R. M. 281].

In springy places, up to an altitude of 1000 m.

Montana: Sand Coulee, 1882, *R. S. Williams, 315.*

Limosella aquatica L. Sp. Pl. 631 [Ill. Fl. **3**: 165; Syn. Fl. **2**^{1}: 284: Bot. Cal. **1**: 571: Man. R. M. 281].

In shallow water, up to an altitude of 2500 m.

Montana: Lower Sand Coulee, 1888, *R. S. Williams, 779:* Gallatin River, 1882, *Canby.*

Yellowstone Park; 1853, *Hayden Survey:* Yellowstone Lake and Turbid Lake, 1885, *Tweedy, 441:* Yellowstone Lake, 1871, *Hayden Survey.*

Synthyris rubra (Hook.); Benth. DC. Prod. **10**: 455 [Syn. Fl. **2**^{1}: 286; Bot. Cal. **1**: 571; Man. R. M. 282]; *Gymnandra rubra* Hook. Fl. Bor. Am. **2**: 103: *Wulfenia rubra* Greene, Erythea, **2**: 83 [Ill. Fl. **3**: 166].

Professor Greene transferred all the species of *Synthyris* to *Wulfenia.* This was, however, not warranted, for the European and Asiatic *Wulfenias* have a corolla with an evident tube, and the capsule is 4-valved instead of 2-valved, neither flattened nor emarginate at the apex.

On hills and mountain sides, at an altitude of 2000–3000 m.

Montana: Deer Lodge, 1888, *F. W. Traphagen:* Helena, 1890, *F. D. Kelsey;* Madison Co., 1888, *F. Tweedy, 69:* Little Belt Mts., 1896, *Flodman, 784;* Bridger Mts., June 15, 1897, *Rydberg & Bessey, 4928* and *4929;* Cedar Mountain, July 16, *4930;* Great Falls, 1888, *R. S. Williams, 115;* Deer Lodge, 1892 and Bozeman, *W. T. Shaw;* Bozeman Pass, 1883, *Scribner, 191.*

Yellowstone Park: Swan Lake, 1885, *F. Tweedy, 886.*

Synthyris plantaginea Benth.; DC. Prod. **10**: 455 [Syn. Fl. **2**^{1}: 286; Man. R. M. 282]; *Wulfenia plantaginea* Greene, Erythea, **2**: 83.

On mountain sides, at an altitude of 2000–3000 m.

Montana: Hell Gate, *John Pearsall.*

Synthyris pinnatifida Wats. King's Exped. **5**: 227 [Syn. Fl. **2**^{1}: 285; Man. R. M. 281]; *Wulfenia pinnatifida* (Wats.) Greene, Erythea, **2**: 83.

On alpine peaks, at an altitude of 3000 m. and more.

MONTANA: Beaver Head Co., 1888, *Tweedy*, *70;* Ruby River, 1887, *269* (second flowering); Old Hollowtop, Pony Mts., July 7, 1897, *Rydberg & Bessey*, *4926;* Bridger Mts., June 15, *4927;* Beaver Head Co,. 1880, *Watson;* Bald Mountain, 1880, *Watson*.

* **Synthyris laciniata** (Gray); *Synthyris pinnatifida laciniata* Gray, Syn. Fl. **2**^{1}: 286.

Gray regarded this as a variety of the preceding, but it is evidently a good species. The leaves are not pinnatifid, but round or reniform and laciniately cleft to the middle or less.

MONTANA: McDonald's Peak, 1883, *Canby*, *255*.

Veronica scutellata L. Sp. Pl. 12 [Ill. Fl. **3**. 167; Syn. Fl. **2**^{1}: 287; Bot. Cal. **1**: 572; Man. R. M. 282].

In brooks, up to an altitude of 2500 m.

MONTANA: Lo-Lo Creek, 1880, *Watson*.

YELLOWSTONE PARK: 1885, *Tweedy*, *881*.

Veronica Anagallis-aquatica L. Sp. Pl. 12 [Ill. Fl. **3**: 167; Syn. Fl. **2**^{1}: 287; Bot. Cal. **1**: 572; Man. R. M. 282].

In water, up to an altitude of 1500 m.

MONTANA: Bozeman, 1886, *Tweedy*, *1162;* Lo-Lo, 1898, *Williams & Griffith*.

Veronica Americana Schwein; Benth. in DC. Prod. **10**: 468 [Ill. Fl. **3**: 167; Syn. Fl. **2**^{1}: 287; Bot. Cal. **1**: 572; Man. R. M. 282].

In water, especially in slow brooks, up to an altitude of 2000 m.

MONTANA: Lodge Pole Creek, 1889, *Dr. V. Havard;* Bozeman, 1895, *Rydberg*, *2783;* Spanish Basin, 1896, *Flodman*, *776* and *777;* Spanish Basin, July 1, 1897, *Rydberg & Bessey*, *4939;* Jack Creek, July 15, *4940;* northern part of the state, 1888, *F. W. Anderson;* Bozeman, 1892, *F. W. Shaw;* Deer Lodge Co., *Emma J. Ware*.

* Veronica Americana crassula.

Small and delicate, scarcely over 1 dm. in height; flowers much smaller than in the ordinary form; leaves 5–10 mm. long, oval or oblong, with a short petiole, rather fleshy, and with an entire margin.

In bogs, at an altitude of 2000–2500 m.

MONTANA: Little Belt Pass, 1896, *Flodman*, *778* (type).
YELLOWSTONE PARK: 1884, *Tweedy*, *48*.

Veronica Wormskjoldii R. & S. Syst. **1**: 101; *Veronica alpina Wormskjoldii* Hook. Bot. Mag. *2975*; *V. alpina* Gray, Syn. Fl. **2**^{1}: 288, in part [Man. R. M. 282]; *V. nutans* Bong. Veg. Sitk. 39.

I think that this should be separated from the European *V. alpina*, which is a much smaller plant with a short spike, large flowers and broadly oval leaves. Along brooks, at an altitude of 2500–3000 m.

MONTANA: Park Co., 1887, *Tweedy*, *54*; Spanish Basin, 1896, *Flodman*, *779*; Little Belt Mts., *780* and *781*; Pony Mts., July 7, 1897, *Rydberg & Bessey*, *4936*; Yogo, *R. S. Williams*, *485*; Lake Plateau, 1897, *P. Koch*, *38* and *44*; Belt Mountain, 1883, *Canby*, *194*; Odell's, 1880, *Watson*.

YELLOWSTONE PARK: 1884, *Tweedy*: 1885, *882*; Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey*, *4935*; East De Lacey's Creek, Aug. 10, *4937*.

Veronica serpyllifolia L. Sp. Pl. 12 [Ill. Fl. **3**: 169; Syn. Fl. **2**^{1}: 288; Bot. Cal. **1**: 572; Man. R. M. 282].

Wet places in open woods, at an altitude of 2000–3000 m.

MONTANA: Bozeman, 1895, *Rydberg*, *2784*; Little Belt Pass, 1896, *Flodman*, *782*; Spanish Basin, *783*; Bridger Mts., June 14, 1897, *Rydberg & Bessey*, *4933*; Belt Creek, 1886, *R. S. Williams*, *486*; Lewis & Clarke Co., *Mrs. Estella Muth*; Boulder Co., 1883, *Scribner*, *193*.

YELLOWSTONE PARK: Yellowstone Lake, *Tweedy*, *880*; East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey*, *4934*; 1883, *Mary Compton*: Mud Springs, 1871, *Hayden Survey*.

Veronica peregrina L. Sp. Pl. 14 [Ill. Fl. **3**: 169: Syn. Fl. **2**^{1}: 288; Bot. Cal. **1**: 572; Man. R. M. 283].

In loose soil and waste places, up to an altitude of 2500 m.

MONTANA: Cedar Mountain, July 16, 1897, *Rydberg & Bessey*, *4931*; Lower Sand Coulee, 1888, *R. S. Williams*, *156*; Cottonwood Creek, 1892, *W. F. Shaw*; Columbia Falls, *Mrs. J. J. Kennedy*, *44*.

YELLOWSTONE PARK: Yellowstone Lake, 1885, *F. Tweedy*, *879*; Upper Geyser Basin, Aug. 8, 1897, *Rydberg & Bessey*, *4932*.

* Castilleja stricta.

Annual; stem strict, 3–8 dm. high, more or less glandular-hirsute, leafy, and with a very long spike-like inflorescence; leaves linear-lanceolate, 3–10 cm. long, 3-nerved, more or less glandular-hirsute, only the upper floral ones tipped with scarlet; flowers pedicellate, about 2 cm. long; calyx ovoid-cylindric, somewhat gibbous at the base, more deeply cleft above than below, equalling or more often a little exceeding the yellow corolla, the lobes linear-lanceolate, acuminate; corolla cylindric, the galea rather broad, about half as long as the tube, the lip small and with rather narrow subequal lobes.

Nearest related to *C. minor*, and has been included in that species by most authors. That species differs, however, in the much more slender stem, the lower portion of which is almost glabrous or merely puberulent, not hirsute, and of a very light color; in the very remote lower flowers; in the calyx, which is almost always shorter than the corolla and scarcely deeper cleft above than below; and in the broader lateral lobes of the lip.

Ranges from Nevada to Wyoming and Montana, while the range of *C. minor* is from New Mexico to Southern California and Mexico. The following specimens have been examined:

MONTANA: Helena, 1888, *F. D. Kelsey;* Warm Springs, 1892, *Kelsey;* Missouri River, 1883, *Scribner, 195.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 42.*

WYOMING: Ft. Washakie, 1894, *A. Nelson, 744.*

UTAH: 1874, *C. C. Parry, 154;* Cache Co., 1890, *C. K. Dodge.*

NEVADA: Ruby Valley, 1868, *S. Watson, 809* (type).

*Castilleja Crista-galli.

Perennial, with a woody caudex, about 4 dm. high, finely pilose throughout, and somewhat villous on the upper parts; lower leaves linear or linear-lanceolate, 5–8 cm. long, 3-nerved, divaricate or somewhat reflexed, the upper broader, ovate or oblong, often divided at the end into 3–5 oblong-linear divisions, those of the spike beautifully coccineous; calyx 2–2.5 cm. long, green at the base, coccineous at the top, cleft on the lower side about two-thirds way down, on the upper scarcely one-half; corolla about 3.5 cm. long, usually somewhat curved and protruding through the lower slit of the calyx, green and tinged with red, especially on the margins of the galea, the latter nearly 1.5 cm. long, the lip about 5 mm. long, dark green, its lobes rather broad.

Resembles somewhat *C. linearifolia* in the size of the flowers, the color and the lower leaves. The calyx is much larger, almost three-fourths the length of the corolla, and is less crimson than in that species. The upper leaves are also much broader, and more like those of *C. rhexifolia*, but usually more cleft, from which it differs in the unequally cleft calyx.

In open woods, at an altitude of 2000 m.

MONTANA: Bridger Mountains, June 17, 1897, *Rydberg & Bessey, 4950.*

Castilleja hispida Benth.; Hook. Fl. Bor. Am. **2**: 105; *Euchroma Bradburii* Nutt. Journ. Acad. Phila. **7**: 47; *Castilleja parviflora* Gray, Am. Journ. Sci. (II.) **33**: 43 [Syn. Fl. **2**^{1}: 296, in part; Bot. Cal. **1**: 574; Man. R. M. 284]; not Bong.

Castilleja parviflora Bongard is not found in the Rocky Mountains: it is characterized by its small flowers and broad pectinately cleft leaves; what has generally gone under that name is the present species. It grows on exposed hills, up to an altitude of 2000 m.

MONTANA: *Wyeth* (*E. Bradburii*, in part); Beaver Head Co., 1888, *F. Tweedy, 37;* Sheridan, 1892, *Mrs. L. H. Fitch.*

* **Castilleja oreophila** Greenman, Bot. Gaz. **25**: 264.

Resembles much *C. hispida*, differing in the lower habit, the deep rose-purple coloration of the bracts and the short inflorescence. It is a truly alpine plant.

MONTANA: Maryville, 1892, *F. D. Kelsey.*

* **Castilleja angustifolia** (Nutt.) G. Don, Gen. Syst. **4**: 616; *Euchroma angustifolia* Nutt. Journ. Acad. Phila. **7**: 46.

Like *C. hispida*, but smaller and less hairy, with narrowly linear leaves, and with smaller flowers.

MONTANA: *Wyeth;* Deer Lodge, 1888, *Traphagen.*

* **Castilleja Suksdorfii** Gray, Proc. Am. Acad. **22**: 311.

Characterized by its dark reddish purple coloration, its creeping rootstock and the long galea which makes the flowers, therefore, much longer than those of the related species.

MONTANA; 1887, *Kelsey.*

YELLOWSTONE PARK: Slough Creek, 1885, *Tweedy, 870.*

* Castilleja rhexifolia.

Perennial, with a woody caudex, about 4 cm. high, glabrous below, more or less villous above; leaves oblong-lanceolate to ovate, 3–5-nerved, about 5 cm. long, the upper often 3–5 cleft, but not deeply so, with lanceolate lobes, the floral ones bright scarlet: calyx about 2.5 cm. long, green at the base, otherwise coccineous or scarlet, about equally cleft above and below, the clefts on the sides about 5 mm. deep; corolla as in *C. Crista-galli*, about 3 cm. long with a galea about 1 cm. in length.

This has apparently been included in *C. mineata*, but is in my opinion not nearly related to that species. It is easily distinguished by the different coloration, the broader leaves, the larger flower and the comparately shorter galea, which is scarcely more than half as long as the tube. The color of this and the following is the same as in *C. Suksdorfii*, but they have a comparatively shorter galea than that species. Grows, like *C. Crista-galli*, in small clumps, but differs in the broader leaves and the equally cleft calyx.

It is not uncommon in open woods in the mountain regions, at an altitude of 2000–3000 m. The following localities have been recorded:

MONTANA: Cedar Mountain, July 16, 1897, *Rydberg & Bessey*, *4951* (type); Near Pony, July 7, *4952;* Spanish Peaks, 1896, *Flodman*, *785;* Gallatin Co., *Mrs. Finlay;* Boulder Creek, 1887, *Tweedy*, *62;* Cutbank Creek, 1883, *Canby*, *257*.

YELLOWSTONE PARK: Electric Peak, August 18, 1897, *Rydberg & Bessey*, *4953*.

WYOMING: LaPlata Mines, *Aven Nelson*, *1808*.

* Castilleja lanceifolia.

Perennial, with a long creeping rootstock, not growing in clumps, 4–6 dm. high, sparingly villous, or glabrate, comparatively very leafy; leaves lanceolate, often acuminate, 3–5 cm. long, rather firm, 3-nerved, the upper seldom if ever cleft; calyx and corolla as in the preceding species; corolla about 3 cm. long with a galea slightly over 1 cm. in length.

In habit, leaves and color strikingly like *C. Suksdorfii*, except that in that species the upper leaves are often cleft. The corolla of *C. Suksdorfii* is different, however, being fully 4 cm. long, with the galea nearly one-half its length. From the preceding it is easily distinguished by the thicker and narrower leaves and the creeping rootstock. Grows on hillsides, especially in rich soil among bushes, at an altitude of 2000–3000 m.

MONTANA: Spanish Basin, June 26 and July 1, 1897, *Rydberg & Bessey*, *4954* (type), *4955* and *4956;* 1896, *Flodman*, *787;* Little Belt Mountains, *786;* Mill Creek, 1887, *Tweedy*, *63;* Trail Creek, *64;* Fort Ellis to Yellowstone, 1871, *Hayden Survey;* Belt Mountains, 1883, *Scribner*, *196;* Upper Marias Pass, 1883, *Canby*, *269*.

YELLOWSTONE PARK: Electric Peak, August 18, 1897, *Rydberg & Bessey, 4957;* East De Lacey's Creek, August 10, *4958;* 1895, *Tweedy, 869* (?).

WYOMING: Gros Ventre River, 1897, *F. Tweedy, 250;* Union Pass, 1894, *Aven Nelson, 835.*

IDAHO: Lake Waha, 1896, *A. A. & E. G. Heller, 3267.*

* Castilleja Tweedyi.

Perennial, from a woody caudex, 1–5 dm. high, finely puberulent all over, or sometimes glabrate, the upper part somewhat villous; lower leaves linear-lanceolate, 3-nerved, 3–6 cm. long, the upper ones broader, and often cleft, the floral ones often yellowish green, tipped with bright red as in *C. mineata;* calyx about 2 cm. long, equally cleft before and behind, the clefts on the side shallow, less than 5 mm. deep; corolla 2.5 cm. long, greenish, tinged and margined with red, the galea shorter than the tube, 1 cm. long; lip green, with broad lobes.

The flowers in form and size resemble those of the preceding two species, but are of a red, not scarlet, color. The most striking difference is, however, in the tufted stems arising from a woody caudex, while in the preceding species they are generally single and from a running rootstock. It most resembles *C. mineata*, and has been included in it. It does not form such large clumps as that species; the upper leaves are often cleft, while in *C. mineata* they are nearly always entire, and the stem is often branched. The main difference is, however, in the flower, which in *C. mineata* has a smaller corolla, scarcely 2 cm. long, and the galea fully as long as the tube; the lip in that species is very dark green and has narrower incurved lobes. It grows in very big clumps, in open meadows in the lower regions of Montana, while *C. Tweedyi* grows on hillsides in the mountains, at an altitude of 2000–3000 m.

MONTANA: Jack Creek, July 14, 1897, *Rydberg & Bessey, 4962* (type); Cedar Mountain, July 16, *4960* (depauperate); Bridger Mountains, June 15, *4959;* Sun River Cañon, 1887, *R. S. Williams, 151;* Deer Lodge, 1888, *F. W. Traphagen.*

WYOMING: Medicine Bow Mountains, *H. Englemann;* Buffalo Fork, 1897, *F. Tweedy, 251.*

Castilleja mineata Dougl.; Hook. Fl. Bor. Am. **2**: 106 [Syn. Fl. **2**¹: 297; Bot. Cal. **1**: 574; Man. R. M. 284]; *Castilleja pallida Unalaschensis* Cham. & Schl. Linnaea, **2**: 581.

This species is characterized by its brick-red bracts and calyx. Grows in big clumps in meadows, up to an altitude of 2000 m.

MONTANA: Wolf Creek, July 24, 1897, *Rydberg & Bessey, 4965*.

* Castilleja sulphurea.

Perennial, with a short more or less branched caudex; stem 3–5 dm. high, striate, finely puberulent or the upper portion slightly villous, simple: leaves lanceolate or the upper ovate, 4–5 cm. long, entire, acute, finely puberulent, 3–5-ribbed, light green; bracts 2–3 cm. long, broadly ovate, obtuse, entire, or with a few small teeth on the side above the middle, 3–5-ribbed, puberulent, light yellow with a greenish base; calyx about 1.5 cm. long, about equally cleft before and behind and cleft about 2–3 mm. at the sides; corolla greenish, tinged with red, 2.2–2.5 cm. long, the galea about three times as long as the lip which is deeply 3-cleft.

In color and general habit it most resembles *C. lutea* Heller, but differs in the form of the leaves and bracts and in the pubescence. *C. lutea* is densely villous, its leaves are cleft into linear-lanceolate segments and its bracts are more or less lobed or cleft. The leaf-form is that of *C. rhexifolia*, described above, from which it is easily distinguished by the color of the bracts and the form of the corolla. Grows on wooded hillsides, at an altitude of about 2000 m.

MONTANA: Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 4966* (type).

WYOMING: Cummins, 1895, *Aven Nelson, 1461*.

SOUTH DAKOTA: Little Elk Creek, 1892, *Rydberg, 929; Box Elder Creek*, 1887, *W. S. Rusby* (these Black Hills specimens with narrower leaves than the type).

* **Castilleja lutea** Heller, Bull. Torr. Bot. Club, **25**: 268.

Somewhat related to *C. hispida*, but characterized by its floral bracts, which are pale yellow and lobed, with the terminal segment broad and rounded, and the lateral ones lanceolate. The lower leaves are lanceolate, the upper 3–5-lobed, with the terminal lobe broader. The pubescence is villous.

MONTANA: Little Belt Mts., 1883, *Scribner, 198*.

YELLOWSTONE PARK: 1883, *Miss Mary Compton*.

* **Castilleja lutescens** (Greenman); *Castilleja pallida lutescens* Greenman, Bot. Gaz. **25**: 265.

Stouter than the next, to which it is related; leaves linear-lanceolate to oblong-lanceolate, the lower entire, the upper often trifid, scabrous especially on the upper surface; lip shorter in proportion to the length of the galea.

MONTANA: Jefferson City, 1883, *Scribner*, *197;* Nevada Creek, 1883, *Canby*, *259*.

Castilleja acuminata (Pursh) Spreng. Syst. **2**: 775 [Ill. Fl. **3**: 180]; *Bartsia acuminata* Pursh, Fl. Am. Sept. 429; *Castilleja septentrionalis* Lindl. Bot. Reg. *925*; *C. pallida septentrionalis* Gray, Bot. Cal. **1**: 575 [Syn. Fl. **2**¹: 297; Man. R. M. 284].

In the mountains, at an altitude of 2500–3000 m.

MONTANA: Indian Creek, July 22, 1897, *Rydberg & Bessey*, *4967*.

YELLOWSTONE PARK: 1885, *Tweedy*, *871* and *872;* Lone Star Geyser, Aug. 7, 1897, *Rydberg & Bessey*, *4961;* Lower Geyser Basin, Aug. 4, *4964*.

Castilleja occidentalis Torr. Ann. Lyc. N. Y. **2**: 230; *Castilleja pallida occidentalis* Gray, Bot. Cal. **1**: 575 [Syn. Fl. **2**¹: 297; Bot. Cal. **1**: 575; Man. R. M. 284].

On the highest alpine peaks, at an altitude of 3000 m. or more.

MONTANA: Mill Creek, 1887, *Tweedy*, *59;* Gallatin Peak, 1886, *1165;* Indian Creek, July 22, 1897, *Rydberg & Bessey*, *4967*.

YELLOWSTONE PARK: 1885, *Tweedy*, *885;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey*, *4968;* Mt. Chittenden, 1885, *Tweedy*, *885*.

Castilleja sessiliflora Pursh, Fl. Am. Sept. 738 [Ill. Fl. **3**: 180; Syn. Fl. **2**¹: 298; Man. R. M. 285].

On dry hills and plains, up to an altitude of 1500 m.

MONTANA: White Bear Creek, Yellowstone Co., 1889, *Tweedy;* Grafton, 1892, *R. S. Williams*, *110;* Cutbank Creek, 1883, *Canby*, *256*.

Castilleja brachyantha; *Castilleja breviflora* Gray, Am. Journ. Sci. (II.) **33**: 338. 1862 [Syn. Fl. **2**¹: 299; Man. R. M. 285]; not DC. 1846.

In alpine regions; rare.

YELLOWSTONE PARK: Hoodoo Peak, 1897, *P. Koch*, *10*.

Castilleja flava Wats. King's Exped. **5**: 230 [Syn. Fl. **2**¹: 299: Man. R. M. 285].

In valleys, up to an altitude of 2500 m.

MONTANA: 1888, *Tweedy*, *66;* Indian Creek, July 21, 1897, *Rydberg & Bessey*, *4969*.

Castilleja pallescens (Gray) Greenman, Bot. Gaz. **25**: 266; *Orthocarpus pallescens* Gray, Am. Jour. Sci. (II.) **33**: 339 [Syn. Fl. **2**¹: 299; Bot. Cal. **1**: 576; Man. R. M. 286].

On dry hillsides, at an altitude of 2000–3000 m.

MONTANA: Spanish Basin, 1896, *Flodman, 789* and *790;* Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 4972;* Bridger Mts., June 12, *4971;* Bozeman, 1892, *W. F. Shaw;* Bozeman, 1887, *Tweedy, 61;* Upper Marias Pass and Blackfoot City, 1883, *Canby, 262.*

YELLOWSTONE PARK: Sepulchre Mt., 1884, *Tweedy, 43:* 1885, *884;* 1873, *C. C. Parry, 218.*

IDAHO: Mt. Chauvet, July 27, 1897, *Rydberg & Bessey, 4973.*

* **Castilleja pilosa** (Wats.); *Orthocarpus pilosus* Wats. King's Exped. **5**: 231 [Bot. Cal. **1**: 576].

On hills and plains, at an altitude of 2000 m.

MONTANA: Beaver Head Co., 1888, *Tweedy, 65.*

YELLOWSTONE PARK: 1885, *Tweedy, 883.*

* Castilleja villosa.

Perennial, about 3 dm. high, strict and simple, villous throughout; leaves ovate, about 3 cm. long and 1 cm. wide, 3-ribbed, with 1 or 2 large lanceolate lobes on each side, densely villous-pubescent; bracts similar but more oblong, with more oblong and obtuse lobes and tinged with yellow: inflorescence long, constituting about two-thirds of the length of the plant; flowers nearly erect; calyx about 2.5 cm. long, equalling the corolla, cleft slightly deeper in front than on the back, villous, its two lobes oblong, truncate, toothed and yellowish at the apex: corolla yellow, villous, the galea about 1 cm. long, about one-half longer than the lip.

A close relative of the two preceding, especially of *C. pilosa*, from which it differs in the denser pubescence, the broader and less divided leaves and bracts, and twice as large flowers. Plains and valleys.

MONTANA: Blackfoot River, 1883, *Canby, 261* (type).

YELLOWSTONE PARK: Black Tail Deer Creek, 1884, *Tweedy, 44.*

Orthocarpus luteus Nutt. Gen. **2**: 57 [Ill. Fl. **3**: 181; Syn. Fl. **2**¹: 301; Bot. Cal. **1**: 577; Man. R. M. 286].

On prairies and in valleys, up to an altitude of 2500 m.

MONTANA: Gallatin Co., 1886, *F. Tweedy;* Bozeman, 1887, *F. Tweedy, 60;* Cottonwood Creek and Bozeman, 1892, *Wm.*

Shaw; Gallatin Co., *Mrs. Mary L. Alderson;* Helena, 1894, *E. Douglas;* Bozeman, 1895, *Rydberg & Bessey, 2788:* Great Falls, 1890, *R. S. Williams, 55;* Judith Gap, 1882, *Canby;* Grasshopper Valley, 1880, *Watson.*

YELLOWSTONE PARK: 1893, *A. Brown;* Mammoth Hot Springs, 1884, *Tweedy, 45;* Lone Star Geyser Basin, Aug. 7, 1897, *Rydberg & Bessey, 4975;* Lake, 1871, *Hayden Survey.*

* **Orthocarpus tenuifolius** Benth. Scroph. Ind. 12; DC. Prod. **10**: 536 [Syn. Fl. **2**¹: 300 and 453; Bot. Cal. **1**: 577]; *O. linearifolius* Gray, Proc. Am. Acad. **19**: 95 [Man. R. M. 286].

Differs from *O. luteus* in the purplish floral leaves, which are unlike the rest, broad, entire or with some lateral lobes, and more or less petaloid. In valleys, up to an altitude of 2000 m.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy:* Gallatin Co., *Mrs. Mary L. Alderson;* Spanish Basin, June 25, 1897, *Rydberg & Bessey, 4970;* Blackfoot River, 1883, *Canby, 263;* Smith River, 1883, *Scribner, 200;* Big Hole Valley and Bitter Root Valley, 1880, *Watson.*

* **Orthocarpus pachystachyus** Gray, Syn. Fl. **2**¹: 300 and 452.

Like the preceding, but with still broader floral leaves and rose-colored corolla. On dry plains, up to an altitude of 1500 m.

MONTANA: Deer Lodge and Gallatin Counties, *Miss Ware* and *Miss Hodgman:* Bozeman, 1895, *Rydberg, 2787:* Trout Creek, *R. S. Williams, 52.*

Adenostegia ramosa (Nutt.) Greene, Pittonia, **2**: 180; *Cordylanthus ramosus* Nutt.; DC. Prod. **10**: 597 [Syn. Fl. **2**¹: 303; Man. R. M. 286: Bot. Cal. **1**: 580].

In dry places, at an altitude of 1000–2000 m.

MONTANA: Grasshopper Valley, 1880, *Watson.*

Elephantella.

Galea produced into a filiform beak which is soon upturned; throat with a tooth on each side; corolla-tube almost included in the 5-toothed calyx; lips very broad; otherwise as in *Pedicularis.*

The following, together with a few others, constitute a very well defined group, very unlike typical *Pedicularis*, and I believe it deserves generic rank. The name is given in allusion to the form of the corolla, which strikingly resembles the head of an elephant, the produced beak of the galea forming the trunk, the lateral lobes of the lip, the ears, and the stigma the finger-like appendage of the trunk.

Elephantella Groenlandica (Retz.) ; *Pedicularis Groenlandica* Retz. Fl. Scand. Ed. 2, 145 [Ill. Fl. **3**: 184; Syn. Fl. **2**^{1}: 306; Bot. Cal. **1**: 582; Man. R. M. 287].

In swamps and wet meadows, at an altitude of 2000–3000 m.

MONTANA: Grasshopper Creek, 1885, *Tweedy, 67;* Beaver Head Co., 1888, *Tweedy, 67;* Boulder Creek, 1887, *52;* Silver Bow Co., *Mrs. Jennie H. Moore;* Sun River, 1887, *R. S. Williams, 695;* Little Belt Mts., 1896, *Flodman, 791;* Spanish Basin, *792;* June 28 and July 1, 1897, *Rydberg & Bessey, 4976* and *4977;* Lake Plateau, 1897, *P. Koch, 30* and *60;* Carbon Creek, 1883, *Canby, 264;* Smith River, 1883, *Scribner, 202;* Madison Valley, 1871, *Hayden Survey.*

YELLOWSTONE PARK: 1893, *A. Brown;* 1888, *Dr. Chas. H. Hall;* 1884, *F. Tweedy, a;* 1885, *891;* 1883, *Mary Compton.*

Pedicularis racemosa Dougl.; Hook. Fl. Bor. Am. **2**: 108 [Syn. Fl. **2**^{1}: 306; Bot. Cal. **1**: 582; Man. R. M. 287].

This species and the next two are so unlike the genus *Pedicularis* proper, that they also might be removed from the genus. The short tube of the corolla, the long and circinate incurved beak of the galea, the very broad lower lip and the calyx cleft in front are characters which I believe are sufficient upon which to establish a new genus. It will be wiser, however, to wait until some work can also be done on the Asiatic species of this group. *P. racemosa* grows on wooded mountain-sides, at an altitude of 1000–3000 m.

MONTANA: Beaver Head Co., 1888, *Tweedy, 68;* Bitter Root Mts., 1860, *J. S. Cooper:* Silver Bow Co., *Mrs. Jennie H. Moore;* Sun River, 1887, *R. S. Williams, 696;* Pony, July 7, 1897, *Rydberg & Bessey, 4980;* Ross' Hole, 1880, *Watson.*

YELLOWSTONE PARK: East Fork, 1884, *Tweedy;* 1885, *890;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 4982;* Hoodoo Peak, 1897, *P. Koch, 4* and *6.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 4981.*

* **Pedicularis contorta** Benth.; Hook. Fl. Bor. Am. **2**: 108 [Syn. Fl. **2**^{1}: 306].

Like the last as to the corolla, but the leaves are pinnately parted into linear serrate lobes, the spikes naked and the calyx-lobes lanceolate.

On mountain-sides, at an altitude of 2000–3000 m.

MONTANA: Mt. Blackmore, 1886, *Tweedy, 1163;* Deer Lodge, 1889, *Traphagen;* Silver Bow Co., *Mrs. Jennie H. Moore, Mrs.*

Helen Dolman; Yogo, *R. S. Williams, 178:* Little Belt Pass, 1896, *Flodman, 793;* Spanish Peaks, *794:* Indian Creek, July 22, 1897, *Rydberg & Bessey, 4978;* Pony, July 7, *4979;* McDonald's Peak and Priest's Pass, 1883, *Canby, 265;* Belt Mountain, 1883, *Scribner, 201:* Odell's and Grasshopper Valley, 1880, *Watson.*

* **Pedicularis ctenophora** Rydb. Bull. Torr. Bot. Club, **24**: 292.

Like *P. contorta*, but the corolla purplish, the calyx more gibbous above, purple-striate and more or less villous at the base, and the bracts larger. Grows on mountains, at an altitude of about 2500 m.

MONTANA: Lima, 1895, *Rydberg, 2789.*

WYOMING: Big Horn Mts., 1898, *Tweedy.*

WASHINGTON: Mt. Stewart, 1883, *T. S. Brandegee, 1026.*

* Pedicularis Hallii.

Perennial, from a short rootstock, glabrous up to the inflorescence; stem 1–1.5 dm. high, almost leafless; basal leaves numerous, deeply pinnately parted into oblong-linear divisions, which are finely crenate-serrate; bracts deeply dissected; calyx more or less villous; corolla nearly 2 cm. long, purple, the galea falcate with a conical beak, without teeth, the lip very broad, crenulate, about half as long as the galea.

Nearest related to *P. Parryi*, with which it has been confused. The form of the leaves and of the corolla is almost the same in the two, but the color of the corolla of *P. Parryi* is ochroleucous or yellow, and the calyx, in all specimens seen by me, glabrate. Most specimens labeled *P. Parryi* from Montana and northern Wyoming probably belong here. The characters in Gray's Synoptical Flora (2^1: 306), "or the inflorescence slightly pubescent," probably refer to this species. I have dedicated this to Dr. Charles H. Hall, who is one of its collectors. Grows on high mountains, at an altitude of about 3000 m.

MONTANA: Lake Plateau, 1897, *P. Koch, 31.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall* (type); 1873, *C. C. Parry, 215*, in part: 1883, *Mary Compton.*

WYOMING: 1897, Mt. Leidy, *Tweedy, 240;* Buffalo Mountain, *241.*

Pedicularis Parryi Gray, Am. Journ. Sc. (II.) **34**: 250 [Syn. Fl. 2^1: 306; Man. R. M. 287].

Alpine peaks, at an altitude of about 3000 m.

MONTANA: Lima, 1895, *Rydberg, 2791.*

Pedicularis bracteosa Benth.; Hook. Fl. Bor. Am. **2**: 110 [Syn. Fl. 2^1: 308; Man. R. M. 288]; *Pedicularis recutita* Pursh, Fl. Am. Sept. **2**: 425.

In wet meadows, at an altitude of 1500–2500 m.

MONTANA: Park Co., 1887, *Tweedy, 51;* 1889, *Tweedy;* Columbia Falls, *Mrs. J. J. Kennedy, 57;* Gallatin Co., *Mrs. Hodgman;* Yogo, 1888, *R. S. Williams, 488;* Granite, 1892, *F. D. Kelsey;* Mystic Lake, 1895, *Rydberg, 2790;* Spanish Basin, 1896, *Flodman, 795;* Indian Creek, July 22, 1897, *Rydberg & Bessey, 4985;* Bozeman, 1883, *Canby;* Belt Mts., *Scribner, 203.*

YELLOWSTONE PARK: 1885, *Tweedy, 889.*

* **Pedicularis Montanensis** Rydb. Bull. Torr. Bot. Club, **24**: 293.

Resembles the preceding, but is more slender, the spike shorter, the corolla purple except a part of the lip which is yellow, and the lower lip wider. In meadows, at an altitude of about 2500 m.

MONTANA: Little Belt Mountains, 1896, *Flodman, 796;* Jocko River, 1883, *Canby, 268*; Upper Marias Pass, 1883, *Canby, 266*, in part.

YELLOWSTONE PARK: Yellowstone Falls, Aug. 14, 1897, *Rydberg & Bessey, 4984.*

* **Pedicularis Canbyi** Gray, Syn. Fl. 2^1: 454.

Resembles somewhat a depauperate *P. racemosa;* but the spike is short, the calyx sparingly villous, the beak of the corolla truncate, and the lip very short, its lobes erose-crenulate. At an altitude of about 2500 m.

MONTANA: McDonald's Peak, 1883, *W. M. Canby, 266*, in part.

* Pedicularis cystopteridifolia.

Pedicularis elata Pursh, Fl. Am. Sept. 425, 1814; not Willd. 1800. †

Perennial, from a short thick rootstock; glabrous up to the villous spike; stem 1–3 dm. high, strict, slightly striate, shining and more or less purple-tinged, rather few-leaved; leaves pinnately divided into triangular-lanceolate segments, these again sharply incised and serrate; bracts lanceolate, long-acuminate, about 2 cm. long; calyx densely villous; corolla very dark reddish purple, over 2 cm. long; galea falcate, arcuate, with a truncate apex and this with a pair of teeth on the lower side, the crenulate lobes of the lip protruding and reaching near to the apex of the galea.

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† Gray makes *P. elata* Pursh, a synonym of *P. bracteosa*. Lewis' specimens at the Philadelphia Academy are mere fragments, but they apparently belong to this species.

Intermediate between *P. scopulorum* and *P. Sudetica*, but often taller and more leafy than either. From the former it differs in the less open corolla, the evident teeth on the lower side of the truncate tip, and in the form of the leaves. In *P. scopulorum* the rachis is rather broad and the divisions of the leaves short and crenulate, while in this the rachis is very narrow, and the divisions long and deeply incised-serrate; in this respect it resembles more *P. Sudetica*, from which it differs in the much more hairy calyx and the less open corolla.

MONTANA: Cedar Mountain, July 16, 1897, *Rydberg & Bessey*, *4983* (type); Park Co., 1887, *F. Tweedy;* Mt. Blackmore, 1886, *1164;* Gallatin Co., *Mrs. M. L. Alderson;* Polk Co., 1887, *Tweedy*.

YELLOWSTONE PARK: Mt. Holmes, 1884, *Tweedy*, *49;* Mt. Washburn, 1885, *888*.

WYOMING: Sheep Mountain, 1897, *Tweedy*, *242*.

Rhinanthus Crista-galli L. Sp. Pl. 603 [Ill. Fl. **3**: 187; Syn. Fl. **2**^{1}: 310; Man. R. M. 288]; *Rhinanthus minor* Ehrh. Beitr. **6**: 44.

In woods, at an altitude not exceeding 1500 m.

MONTANA: Columbia Falls, 1892, *R. S. Williams*, *895*.

* **Melampyrum lineare** Lam. Enc. **4**: 22 [Ill. Fl. **3**: 188]; *Melampyrum Americanum* Michx. Fl. Bor. Am. **2**: 16 [Syn. Fl. **2**^{1}: 310].

A small plant with linear or lanceolate opposite leaves, turning black in drying, and small axillary pale-yellow flowers. In thickets, at an altitude of less than 1500 m.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy*, *40;* Jocko River, 1883, *Canby*, *269*.

OROBANCHACEAE.

Orobanche Ludoviciana Nutt. Gen. 2: 58 [Ill. Fl. **3**: 196]: *Aphyllon Ludovicianum* Gray, Bot. Cal. **1**: 585 [Syn. Fl. **2**^{1}: 313; Bot. Cal. **1**: 585; Man. R. M. 289].

Parasitic mostly on *Artemisias*, *Ambrosias* and other composites. In sandy soil, reaching an altitude of 2000 m.

MONTANA: Indian Creek, July 22, 1897, *Rydberg & Bessey*, *4988;* south of Snowy Mountains, 1882, *Canby*.

YELLOWSTONE PARK: Pelican Creek, 1885, *Tweedy*, *425*.

Thalesia fasciculata (Nutt.) Britton, Mem. Torr. Bot. Club, **5**: 298 [Ill. Fl. **3**: 195]; *Orobanche fasciculata* Nutt. Gen. **2**: 59; *Aphyllon fasciculatum* Gray, Man. 290 [Syn. Fl. **2**^{1}: 312; Bot. Cal. **1**: 584; Man. R. M. 289].

Parasitic commonly on species of *Artemisia*. On dry hills, up to an altitude of 2500 m.

MONTANA: Helena, 1890, *F. D. Kelsey;* Indian Creek, July 22, 1897, *Rydberg & Bessey, 4989;* Spanish Basin, 1895, *Flodman, 797;* Park Co., 1887, *Tweedy, 178;* Spanish Basin, June 24, 1897, *Rydberg & Bessey, 4991;* Gallatin Co., *Mrs. Mary L. Alderson;* 1883, *Scribner, 208.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Yellowstone Lake, 1871, *Hayden Survey.*

Thalesia fasciculata lutea (Parry) Britton, Mem. Torr. Bot. Club, **5**: 298 [Ill. Fl. **3**: 195]; *Philipaea lutea* Parry, Am. Nat. **8**: 214; *Aphyllon fasciculatum luteum* Gray, Syn. Fl. **2**^{1}: 312 [Man. R. M. 289].

Parasitic on grasses. Growing on dry plains or hills, up to an altitude of 2500 m.

MONTANA: Bridger Mts., June 14, 1897, *Rydberg & Bessey, 4992;* Sixteen Mile Creek, 1883, *Scribner, 207.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 202.*

* **Thalesia purpurea** Heller, Bull. Torr. Bot. Club, **24**: 313.

Resembles *T. uniflora*, but has larger and darker flowers. It grows on open gravelly hills, up to an altitude of 200 m.

MONTANA: Deer Lodge Co., *Miss Emma Ware;* West Gallatin, 1883, *Scribner, 206.*

LENTIBULARIACEAE.

Utricularia vulgaris L. Sp. Pl. 18 [Ill. Fl. **3**: 191; Syn. Fl. **2**^{1}: 315; Bot. Cal. **1**: 586; Man. R. M. 290].

In stagnant water, up to an altitude of 2500 m.

MONTANA: Lower Sand Coulee, 1891, *R. S. Williams, 617;* Alhambra, 1892, *F. D. Kelsey;* Sun River, 1883, *Scribner, 205.*

YELLOWSTONE PARK: Lone Star Geyser Basin, Aug. 7, 1897, *Rydberg & Bessey, 4986;* Lewis Lake, 1884, *Tweedy, 228.*

Utricularia minor L. Sp. Pl. 18 [Ill. Fl. **3**: 192; Syn. Fl. **2**^{1}: 315; Bot. Cal. **1**: 586; Man. R. M. 290].

In shallow still water, up to an altitude of 2500 m.

YELLOWSTONE PARK: Lone Star Geyser Basin, Aug. 7, 1897, *Rydberg & Bessey, 4987*.

PLANTAGINACEAE.

Plantago major L. Sp. Pl. 112 [Ill. Fl. **3**: 206; Syn. Fl. **2**^{1}: 389; Bot. Cal. **1**: 611; Man. R. M. 299].

In waste places, up to an altitude of 2000 m.

MONTANA: Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 4990;* Madison River, 1886, *Tweedy, 1208;* Elliston, 1889, *Kelsey*.

* **Plantago Asiatica** L. Sp. Pl. 113; *Plantago major Asiatica* Decaisne, according to Gray, Syn. Fl. **2**^{1}: 389.

In habit it is almost identical with *P. Rugelii* Decaisne, from which it differs mainly in the much shorter capsule and the less carinate and broader bracts and sepals. *P. Rugelii* is confined to Eastern and Southern North America. Its place in the West is taken by the present species. From *P. major* it is distinguished by the longer acute spike, and the capsule which is circumscissile much below the middle.

MONTANA: Manhattan, 1895, *Rydberg, 2792;* Great Falls, 1886, *R. S. Williams, 808;* Bozeman, *W. T. Shaw*.

* **Plantago Tweedyi** Gray, Syn. Fl. **2**^{1}: 390.

Resembles somewhat a depauperate form of *P. major*, but has narrower oblong thin leaves, mostly 3–5-ribbed. On grassy slopes, at an altitude of 2000–2500 m.

MONTANA: Gallatin River, 1886, *Tweedy, 1205*.

YELLOWSTONE PARK: Mirror Lake Plateau and East Fork, 1885, *Tweedy, 452*.

Plantago eriopoda Torr. Ann. Lyc. N. Y. **2**: 237 [Ill. Fl. **3**: 208; Syn. Fl. **2**^{1}: 390; Man. R. M. 300].

In saline meadows, up to an altitude of 2000 m.

MONTANA: Ennis, 1886, *Tweedy, 1204;* Jack Creek, July 19, 1897, *Rydberg & Bessey, 4994;* Helena, 1892, *Kelsey;* Gallatin Co., *Mrs. Alderson;* Madison River, 1883, *Scribner, 219;* Judith Basin, 1882, *Canby*.

Plantago Purshii R. & S. Syst. **3**: 120 [Ill. Fl. **3**: 209]; *Plantago gnaphalioides* Nutt. Gen. **1**: 100; *Plantago Patagonica gnaphalioides* Gray, Man. Ed. 2, 269 [Syn. Fl. **2**^{1}: 391; Man. R. M. 300].

In loose soil, old fields, waste places and on sandy prairies, up to an altitude of 2500 m.

MONTANA: Helena, 1888, *F. D. Kelsey;* Madison Co., 1886, *F. Tweedy, 1207;* Spanish Basin, June 28, 1897, *Rydberg & Bessey, 4993;* Great Falls, 1891, *R. S. Williams;* Gallatin Co., *Mrs. Alderson;* Deer Lodge, 1892, *W. T. Shaw;* Custer Co., 1892, *Mrs. Light.*

YELLOWSTONE PARK: 1883, *Mary Compton.*

Plantago aristata Michx. Fl. Bor. Am. **1**: 95 [Ill. Fl. **3**: 209]: *Plantago Patagonica aristata* Gray, Man. Ed. 2: 269 [Syn. Fl. **2**^{1}: 391; Man. R. M. 300].

On prairies and plains, up to an altitude of 2000 m.

MONTANA: Madison Co., 1886, *Tweedy, 1206.*

* Plantago myosuroides.

Plantago Bigelovii Wats. King's Exp. **5**: 212; not A. Gray; *Plantago pusilla* Gray, Syn. Fl. **2**^{1}: 392, in part; not Nutt.

A small cinereous-puberulent annual; leaves narrowly linear, 3–8 cm. long and 1–2 mm. wide; spikes several, 4–6 cm. long, on scapes of nearly the same length; bracts boat-shaped, *i. e.*, strongly carinate, especially the lower portion, and scarious-margined; sepals oval, obtuse and scarious-margined, about 1.5 mm. long; corolla of the fertile flower narrowed and closing over the maturing capsule which is about 3 mm. long, or about twice the length of the sepals, ellipsoid, finely muriculate under the lens: seeds 2 in each cavity, oblong, flattish, dark brown.

Nearest related to *P. pusilla* Nutt., differing in the larger size, larger flowers, the longer capsule which is twice as long as the sepals and circumscissile below the middle, and in the more decidedly carinate bracts.

MONTANA: *Tweedy.*

It has also been collected by *Geyer* on the Upper Missouri.

UTAH: 1869, *S. Watson, 749* (type).

ASSINIBOIA: Cypress Hills, 1894, *John Macoun, 5861.*

CAPRIFOLIACEAE.

Sambucus melanocarpa Gray, Proc. Am. Acad. **19**: 76 [Syn. Fl. **1**^{2}: 8; Man. R. M. 124].

In cañons and along streams, up to an altitude of 2500 m.

MONTANA: Mullan Tunnel, 1890, *F. D. Kelsey;* Granite, 1892, *Kelsey;* Melrose, 1895, *Rydberg, 2796;* Spanish Basin, 1896, *Flodman, 809* and *810;* West Boulder, 1887, *Tweedy, 78;* Bozeman, 1892, *W. T. Shaw;* Madison Co., *Mrs. L. A. Fitch;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 5027* and *5031;* Bridger Mountain, June 18, *5028;* Spanish Basin, June 26, *5029;* Pony, July 7, *5030;* Prickly Pear Creek, 1883, *Scribner, 67c.*

YELLOWSTONE PARK: Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 5032.*

Sambucus pubens Michx. Fl. Bor. Am. **1**: 181 [Ill. Fl. **3**: 228]; *Sambucus racemosa* Hook. Fl. Bor. Am. **1**: 279 [Syn. Fl. **1**^{2}: 8; Bot. Cal. **1**: 278; Man. R. M. 124].

In the mountains, at an altitude of 2000 m. and more.

YELLOWSTONE PARK: 1884, *F. Tweedy, 299.*

Sambucus Canadensis L. Sp. Pl. 269 [Ill. Fl. **3**: 228; Syn. Fl. **1**^{2}: 9; Man. R. M. 124].

Along streams, up to an altitude of 2500 m.; rare.

MONTANA: Deer Lodge Co., *Emma J. Ware.*

Viburnum pauciflorum Pylaie; Torr. & Gray, Fl. N. Am. **2**: 17 [Ill. Fl. **3**: 230; Syn. Fl. **1**^{2}: 10; Man. R. M. 124].

Along streams, up to an altitude of 2000 m.

MONTANA: South Mill Creek, 1887, *F. Tweedy, 76;* Flathead River, 1883, *Canby, 159.*

Symphoricarpos racemosus Michx. Fl. Bor. Am. **1**: 107 [Ill. Fl. **3**: 235; Syn. Fl. **1**^{2}: 13; Bot. Cal. **1**: 279; Man. R. M. 125].

In valleys and cañons, at an altitude of 1500–2000 m.

MONTANA: Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 2025;* Jack Creek, July 14, *2026.*

YELLOWSTONE PARK: Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 5024.*

Symphoricarpos pauciflorus (Robbins) Britton, Mem. Torr. Bot. Club, **5**: 305 [Ill. Fl. **3**: 236]; *Symphoricarpos racemosus pauciflorus* Robbins; Gray, Man. Ed. 5, 203 [Syn. Fl. **1**^{2}: 14; Man. R. M. 125].

On hillsides, at an altitude of 1500–2000 m.

MONTANA: *F. W. Anderson;* Belt River, 1886, *R. S. Williams, 388;* Jack Creek, July 14, 1897, *Rydberg & Bessey, 5022;* Forks of the Madison, July 26, *5023.*

Symphoricarpos occidentalis Hook. Fl. Bor. Am. 1: 285 [Ill. Fl. 3: 236; Syn. Fl. 1^2: 13; Man. R. M. 125].

In open valleys, up to an altitude of 2200 m.

MONTANA: Helena, 1889 and 1890, *F. D. Kelsey;* Madison Co., 1886, *Tweedy, 1086;* Lewis and Clarke Co., *Mrs. E. Muth;* West Gallatin River, 1892, *W. T. Shaw;* Wolf Creek, July 24, 1897, *Rydberg & Bessey, 5015;* Forks of the Madison, July 26, *5016;* Snowy Mountain, 1882, *Canby;* Horned Creek, 1883, *Scribner, 67.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy;* 1885, *788.*

* Symphoricarpos vaccinioides.

Symphoricarpos montanus Wats. King's Exped. 5: 132, in part; not H.B.K. *S. rotundifolius* Gray, Syn. Fl. 1^2: 14, in part.

A densely and intricately branched shrub, 5–8 dm. high; bark of the older stems dark grayish brown and shreddy, that of the young branches very light yellowish brown and shining; leaves about 2 cm. long, oval, acute at both ends, dark green above, more or less glaucous beneath, puberulent or glabrate; corolla elongated-campanulate or cylindric-funnelform, 6–8 mm. long and 3–4 mm. in diameter, the lobes rounded, merely spreading; berry white, about 1 cm. long and 7 mm. in diameter, ellipsoid; seeds about 5 mm. long, slightly acutish at the lower end.

S. vaccinioides is intermediate between *S. oreophilus* and *S. rotundifolius.* It resembles most the former in the foliage and the seeds, but the latter in the flowers; in the herbaria it is found under both names. Glabrate specimens in fruit are very hard to distinguish from those of *S. oreophilus*, but the calyx-lobes are shorter; in flower, however, the two are readily separated, as the corolla of *S. vaccinioides* is scarcely more than half as long as that of *S. oreophilus. S. rotundifolius* differs from both in the round or broadly ovate obtuse densely hairy leaves. Probably all the specimens from the northern Rockies, referred to either *S. oreophilus* or *S. rotundifolius*, belong to *S. vaccinioides:* at least that is the case with all found in the Herbarium of Columbia University. The following specimens belong to this species:

MONTANA: Lima, 1895, *Rydberg, 2795;* Forks of the Madison, July 24, 1897, *Rydberg & Bessey, 5017* (type); Indian Creek, July 22, *5018;* German Gulch, 1889, *F. W. Traphagen.*

YELLOWSTONE PARK: Electric Peak, August 18 and 20, 1897, *Rydberg & Bessey, 5019* and *5020.*

WYOMING: Spread Creek, 1897, *Tweedy, 455:* Carper Mountain, 1894, *Aven Nelson, 608.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5021.*

WASHINGTON: Mt. Paddo, 1883, *W. N. Suksdorf* (referred to *S. rotundifolius* by Gray).

UTAH: 1874, *C. C. Parry, 88;* Beaver Valley, 1877, *E. Palmer, 1885*; Uintas, 1869, *S. Watson, 475* (?), in part.

Linnaea borealis L. Sp. Pl. 631 [Ill. Fl. **3**: 235; Syn. Fl. **1**²: 13: Bot. Cal. **1**: 278; Man. R. M. 124].

In damp woods, at an altitude of 1500–2500 m.

MONTANA: Little Rocky Mts., 1889, *Dr. V. Havard;* Granite, 1892, *F. D. Kelsey;* Sheep Creek, 1896, *Flodman, 807;* Spanish Basin, *808;* Deer Lodge Co., *Emma J. Ware;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 5009.*

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 5008;* Lower Falls, 1871, *Hayden Survey.*

* Lonicera ebractulata.

A shrub 1–2 m. high, with gray bark, divaricately branched; leaves light green, somewhat glaucous beneath, hairy on the lower surface and ciliate on the margins; petioles 5–10 mm. long; blade elliptic-ovate to broadly ovate, obtuse, rounded or cordate at the base, rounded at the apex, 2–6 cm. long, 1–3 cm. wide; flowers in pairs from the axils of the leaves; peduncles about 1 cm. long; bracts small, about 1 mm. long, scarcely one-third the length of the ovary; bractlets apparently none; ovaries distinct, diverging; corolla light yellow, nearly 2 cm. long, funnelform, saccate at the base on the ventral side; tube hairy within; berry red, 6–8 mm. in diameter.

Closely related to *L. Utahensis* and *L. ciliata*, but the former has narrower glabrous leaves, while in the latter the leaves are generally acutish; both have bracts half as long as the ovary or more, and evident but small oblong or rounded bractlets. It grows at an altitude of 1000–2000 m.

MONTANA: Spanish Basin, July 28, 1897, *Rydberg & Bessey, 5010* (type); Park Co., West Boulder, 1887, *Tweedy, 77;* Upper Sand Coulee, 1888, *R. S. Williams.*

IDAHO: Latah Co., 1893, *C. V. Piper, 1719;* Lake Waha, 1896, *A. A. & E. G. Heller, 3179;* Pioneer, 1892, *Isabel Mulford.*

Lonicera Utahensis Wats. King's Exped. **5**: 133 [Syn. Fl. **1**²: 15; Man. R. M. 125].

On wooded hillsides, at an altitude of 2000–2500 m.

MONTANA: Yogo, 1888, *R. S. Williams, 495;* Spanish Basin, 1896, *Flodman, 805* and *806;* Silver Bow Co., *Mrs. Jennie H. Moore;* Deer Lodge, 1892, *W. T. Shaw;* Bozeman, 1883, *Canby, 162.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1888, *Dr. Chas. H. Hall;* 1885, *Tweedy, 790.*

* **Lonicera coerulea** L. Sp. Pl. 174 [Ill. Fl. **3**: 240; Syn. Fl. **1**^{2}: 15; Bot. Cal. **1**: 281].

The specimens referred here may belong to an undescribed species, but as they are in fruit and no flowers have been seen, I refer them to the species to which they are nearest related. They have the bluish green leaves and the dark fruit with a bloom of *L. coerulea*, but the leaves are longer, more tapering at the base and thinner, and the young branches are light yellow. It grows in open woods, at an altitude of about 2500 m.

YELLOWSTONE PARK: North Fork of Gibbon River, 1884, *F. Tweedy, 298;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 5011;* Yellowstone Falls, Aug. 14, 1897, *5012;* Lone Star Geyser, Aug. 7, *5013.*

Lonicera ciliosa Poir. Encycl. Meth. **5**: 612 [Syn. Fl. **1**^{2}: 16; Man. R. M. 126].

On wooded mountain-sides, up to an altitude of perhaps 2000 m.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 886;* Flathead Lake, 1883, *Canby, 161.*

Lonicera involucrata (Richards.) Banks.; Richards. Frankl. Journ. App. Ed. 2, 6 [Ill. Fl. **3**: 242; Syn. Fl. **1**^{2}: 16; Bot. Cal. **1**: 280; Man. R. M. 126]; *Xylosteum involucratum* Richards. l. c.

In wet places in the mountains, at an altitude of 1500–2500 m.

MONTANA: Deer Lodge, 1889, *F. W. Traphagen;* 1845, *Geyer, 85;* Sun River, 1887, *R. S. Williams, 622;* Granite, 1892, *F. D. Kelsey;* Beaver Head Co., 1888, *Tweedy, 138;* Silver Bow Co., *Miss E. Hotchkiss;* Lake Abundance, 1897, *P. Koch, 78.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* 1885, *Tweedy, 789;* Yellowstone Lake, Aug. 12, 1897, *Rydberg & Bessey, 5014.*

ADOXACEAE.

Adoxa moschatellina L. Sp. Pl. 367 [Ill. Fl. 3: 243: Syn. Fl. 1^2: 8: Man. R. M. 123].

In wet shady rocky places, at an altitude of 1500–2000 m.

MONTANA: Basin, 1892, *Kelsey*.

RUBIACEAE.

Galium Aparine L. Sp. Pl. 108 [Ill. Fl. 3: 220; Syn. Fl. 1^2: 36: Bot. Cal. 1: 284; Man. R. M. 127].

In rich open woods and among bushes, up to an altitude of 2000 m.

MONTANA: Bridger Mts., June 14, 1897, *Rydberg & Bessey, 5043*.

Galium Vaillantii DC. Fl. Franc. 4: 263; *Galium spurium* L. Sp. Pl. 106 (?) [Ill. Fl. 3: 220]: *Galium Aparine Vaillantii* Koch, Fl. Germ. 330 [Syn. Fl. 1^2: 36; Man. R. M. 127].

The name *G. spurium* has been taken up for this species; but it is described as having glabrate fruit which is not the case in the present species, in which the fruit is even more bristly than in *G. Aparine*.

MONTANA: Giant Spring, 1885, *R. S. Williams, 274;* Bozeman, 1884, *Tweedy, 85*: Bridger Mts., June 18, 1897, *Rydberg & Bessey, 5041;* Forks of the Madison, June 26, 1897, *5042*.

YELLOWSTONE PARK: Swan Lake, 1885, *Tweedy, 526* and *529*.

Galium triflorum Michx. Fl. Bor. Am. 1: 80 [Ill. Fl. 3: 223; Syn. Fl. 1^2: 39: Bot. Cal. 1: 284; Man. R. M. 127].

In swamps and wet meadows, up to an altitude of 2500 m.

MONTANA: Bozeman, 1889, *F. D. Kelsey;* Sheep Creek, 1896, *Flodman, 815;* Lewis & Clarke Co., *Mrs. E. Muth;* Bear Creek Cañon, 1892, *W. T. Shaw;* Emigrant Gulch, Aug. 22, 1897, *Rydberg & Bessey, 5034;* Fort Ellis to the Yellowstone, 1871, *Hayden Survey*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 527;* Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 5033*.

Galium boreale L. Sp. Pl. 108 [Ill. Fl. 3: 222; Syn. Fl. 1^2: 38: Bot. Cal. 1: 285; Man. R. M. 127].

Among bushes, up to an altitude of 2500 m.

MONTANA: Helena, 1890, *F. D. Kelsey;* Belt River, 1886, *R. S. Williams, 389;* Spanish Basin, 1896, *Flodman, 811;* Bozeman, *812;* Bozeman, 1887, *Tweedy, 164;* West Gallatin River, 1892, *W. T. Shaw;* Bridger Mts., June 17, 1897, *Rydberg & Bessey, 5038;*

Jack Creek, July 14, *5039;* Silver Bow Co., *Mrs. Christie:* Jefferson City, 1883, *Scribner, 67b:* Fort Ellis, 1871, *Hayden Survey.*

YELLOWSTONE PARK: 1886, *Francis Hall;* 1884, *Tweedy.*

* Galium boreale linearifolium.

Leaves narrowly linear with involute margins and faint lateral ribs; margins and ribs mostly hispidulous-ciliate; flowers smaller, ochroleucous; fruit densely hispid.

May be distinct from *G. boreale*, but good characters are lacking. Grows among bushes, at an altitude of 1000–2000 m.

NEBRASKA: Pumpkin Seed Valley, 1891, *Rydberg, 134* (type).

MONTANA: East Gallatin Swamps, 1896, *Flodman, 813.*

WASHINGTON: Palace Camp, 1883, *Mrs. Bailey Willis.*

Galium trifidum L. Sp. Pl. 105 [Ill. Fl. **3**: 224; Syn. Fl. **1**^{2}: 38: Bot. Cal. **1**: 284; Man. R. M. 128].

In wet meadows, up to an altitude of 2500 m.

MONTANA: Belt River, 1886, *R. S. Williams, 369:* East Gallatin Swamps, 1896, *Flodman, 814;* Fort Logan, 1882, *Canby.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 528,* in part.

* **Galium trifidum subbiflorum** Wiegand, Bull. Torr. Bot. Club, **24**: 399.

Leaves broader, mostly oblong: stem less scabrous. In wet meadows, at an altitude of 1000–2500 m.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey, 5036.*

YELLOWSTONE PARK: Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 5037;* Mammoth Hot Springs, 1885, *Tweedy, 528,* in part.

* **Galium Brandegei** Gray, Proc. Am. Acad. **12**: 58 [Syn. Fl. **1**^{2}: 38].

Like *G. trifidum*, but leaves smaller, usually in fours, somewhat fleshy, spatulate-oblong, with indistinct midrib, one or two of the whorl generally smaller; stem commonly glabrous. Moist ground, especially in sandy soil, at an altitude of about 2500 m.

YELLOWSTONE PARK: Stevenson Island, 1885, *Tweedy, 528;* East DeLacey's Creek, Aug. 10, 1897, *Rydberg & Bessey, 5035.*

Galium bifolium Wats. King's Exped. **5**: 134 [Syn. Fl. **1**^{2}: 36; Bot. Cal. **1**: 283; Man. R. M. 128].

Around springs, at an altitude of 2000–2500 m.

MONTANA: Bridger Mts., June 12, 1897, *Rydberg & Bessey, 5040;* Headwaters of Jocko River, 1883, *Canby, 163.*

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 530.*

VALERIANACEAE.

Valeriana edulis Nutt.; Torr. & Gray, Fl. N. Am. **2**: 48 [Ill. Fl. **3**: 244: Syn. Fl. **1**^{2}: 42: Bot. Cal. **1**: 287: Man. R. M. 128]. On dry hills, at an altitude of 2000–3000 m.

MONTANA: Helena, 1890, *F. D. Kelsey;* 1887, *R. S. Williams, 689;* Columbia Falls, *Mrs. J. J. Kennedy, 39:* Madison River, 1883, *Scribner, 68.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* 1884, *Tweedy, 110:* Lone Star Geyser Basin, Aug. 7, 1897, *Rydberg & Bessey, 5006.*

* **Valeriana capitata** Pall.; Link, Jahrb. **1**^{3}: 66 [Syn. Fl. **1**^{2}: 43].

The flowers are similar to those of *V. Sitchensis*, but the plant is smaller, the leaflets are mostly entire, and the inflorescence is more or less headlike. High mountains, at an altitude of 2000 m.

MONTANA: Lima, 1895, *Rydberg, 2794.*

Valeriana septentrionalis; *Valeriana sylvatica* Banks; Richards. Frankl. Journ. Ed. 2, App. 2, 1823 [Ill. Fl. **3**: 244; Syn. Fl. **1**^{2}: 43; Bot. Cal. **1**: 287: Man. R. M. 129]; not F. W. Schmidt, 1795. In wet places, up to an altitude of 3000 m.

MONTANA: Helena, 1890, *F. D. Kelsey;* Yogo, 1888, *R. S. Williams, 195;* Marysville, 1892, *F. D. Kelsey;* Little Belt Mts., 1896, *Flodman, 801;* Spanish Basin, *802* and *803:* Beaver Head Co., 1888, *Tweedy, 161;* Deer Lodge Co., *Emma J. Ware:* Bridger Mountains, June 15 and 17, 1897, *Rydberg & Bessey, 5001* and *5004:* Jack Creek, July 14, *5002;* Pony, July 7, *5003;* Ft. Ellis, 1883, *Scribner, 68a.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5005.*

* **Valeriana occidentalis** Heller, Bull. Torr. Bot. Club, **25**: 269.

Like *V. sylvatica*, but much larger, 6–7 dm. high, with large basal leaves, 2–3 dm. long, and more or less sinuately dentate upper leaflets. In bogs, at an altitude of 2000–2500 m.

MONTANA: Park Co., 1887, *Tweedy, 302.*

YELLOWSTONE PARK: 1884, *Tweedy, 109.*†

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† A few of the specimens cited under the preceding species may belong here, as they had passed out of my hands before Heller's description appeared in print.

Valeriana Scouleri; *Valeriana pauciflora* Hook. Fl. Bor. Am. **1**: 292, 1833; not Pursh, 1814; *V. Hookeri* Schuttl. Flora, **20**: 450, 1837; not *V. Hookeriana* Wight & Arn., 1834; *V. capitata Hookeri* Torr. & Gray, Fl. N. Am. **2**: 48; *V. Sitchensis* Gray, Syn. Fl. **1**^{2}: 43, 1884, mainly [Man. R. M. 129]; not Bong., 1831.

Good specimens of *V. Sitchensis* Bong. have been collected at Disenchantment Bay by Funston in 1892 (*87*), and at Yes Bay by Gorman in 1893 (*93*). These specimens agree fully with Bongard's description and show that the Alaskan plant is very unlike the plant from the Columbia Region and Northern Rockies. The former has very broad and coarsely dentate leaflets, and larger flowers, 6 mm. long, with a cylindric tube. The white pubescence at the base of the leaflets and the petioles and the lack of basal leaves at the time of flowering, pointed out by Bongard, are very conspicuous in both Funston's and Gorman's plants. The Rocky Mountain plant has nearly always several basal leaves, the corolla 5 mm. or less long and more distinctly funnelform, as described by Gray, and wavy or only slightly dentate leaflets. It was first collected by Scouler. Grows in wet meadows and on creek-banks, at an altitude of 2000–3000 m.

MONTANA: Little Belt Mountains, 1896, *Flodman*, *804*; Deer Lodge Co., *Emma Ware*; Bridger Mountains, 1897, *Rydberg & Bessey*, *4998* and *5000*; Pony, July 7, *4999*.

CUCURBITACEAE.

Micrampelis lobata (Michx.) Greene, Pittonia, **2**: 128 [Ill. Fl. **3**: 251]; *Sicyos lobata* Michx. Fl. Bor. Am. **2**: 217; *Echinocystis lobata* Torr. & Gray, Fl. N. Am. **1**: 542 [Man. R. M. 109].

On river-banks among bushes, up to an altitude of 1500 m.

MONTANA: Upper Missouri, *F. W. Anderson;* Glendive, 1892, *Mrs. Miller*.

CAMPANULACEAE.

Campanula rotundifolia L. Sp. Pl. 163 [Ill. Fl. **3**: 253; Syn. Fl. **2**^{1}: 12; Bot. Cal. **1**: 447; Man. R. M. 226].

In open woods and on hillsides, up to an altitude of 2500 m.

MONTANA: Spanish Basin, 1898, *Flodman*, *798;* Little Belt Mts., *800;* Bozeman Cañon, 1897, *H. S. Jennings;* Deer Lodge Co., *Francis Hobson*; Jack Creek, July 14, 1897, *Rydberg & Bessey, 4996*: Spanish Basin, June 23, *4997*; Anaconda and Helena, 1892, *Kelsey*; Warm Springs, 1883, *Scribner, 132*: Blackfoot River, 1883, *Canby, 215*.

YELLOWSTONE PARK: 1884, *Tweedy*.

Legouzia leptocarpa (Nutt.) Britton, Mem. Torr. Bot. Club, **5**: 309 [Ill. Fl. **3**: 256]; *Campylocera leptocarpa* Nutt. Trans. Am. Phil. Soc. (II.) **8**: 257; *Specularia leptocarpa* Gray, Proc. Am. Acad. **11**: 82 [Syn. Fl. **2**^{1}: 10: Man. R. M. 225].

In sandy soil, up to an altitude of 1500 m.

MONTANA: Sand Coulee, 1887, *F. W. Anderson*, and 1885, *R. S. Williams*: Sixteen Mile Creek, 1883, *Scribner, 131*.

Legouzia perfoliata (L.) Britton, Mem. Torr. Bot. Club, **5**: 309 [Ill. Fl. **3**: 256]; *Campanula perfoliata* L. Sp. Pl. 169; *Specularia perfoliata* DC. Mon. Camp. 351 [Syn. Fl. **2**^{1}: 11: Bot. Cal. **1**: 447: Man. R. M. 225].

On hillsides, up to an altitude of 2000 m.

MONTANA: Pony, July 6, 1897, *Rydberg & Bessey, 4995*; Great Falls, 1891, *R. S. Williams*.

LOBELIACEAE.

* Lobelia Kalmii strictiflora.

Slender, 1–2 dm. high, simple or branched with almost erect branches; basal leaves small, 5–10 mm. long, obovate, hairy; stem-leaves linear: pedicels 5–8 mm. long, erect; capsule more acute below than in the eastern form.

The characters given above are constant in all the specimens seen from the Rocky Mountain region, but, as their number is very small, I have hesitated in assigning specific rank to it.

MONTANA: Teton River, 1883, *Scribner, 130*.

ASSINIBOIA: Hurricane Hills, 1883, *J. M. Macoun*.

Laurentia carnosula (Hook. & Arn.) Benth.; Gray, Bot. Cal. **1**: 444 [Syn. Fl. **2**^{1}: 8: Man. R. M. 225]; *Lobelia carnosula* Hook. & Arn. Bot. Beech. 362.

Muddy borders of ponds and streams, at an altitude of 2000–2500 m.

YELLOWSTONE PARK: Yellowstone Lake, 1871, *Hayden Survey*; 1873, *C. C. Parry*.

COMPOSITAE.

Kuhnia glutinosa Ell. Bot. S. C. & Ga. **2**: 292 [Ill. Fl. **3**: 315]; *Kuhnia eupatorioides corymbulosa* Torr. & Gray, Fl. N. Am. **2**: 78 [Syn. Fl. 1^2: 103; Man. R. M. 143].

On prairies and plains, up to an altitude of 2500 m.

MONTANA: Cinnabar, 1884, *Tweedy, 165*: Missouri River, 1883, *Scribner, 70;* Billings, 1898, *Williams & Griffith*.

YELLOWSTONE PARK: 1884, *Tweedy, 165*.

Coleosanthus grandiflorus (Hook.) Kuntze, Rev. Gen. Pl. **1**: 328 [Ill. Fl. **3**: 314]; *Eupatorium grandiflorum* Hook. Fl. Bor. Am. **2**: 26: *Brickellia grandiflora* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 287 [Syn. Fl. 1^2: 105; Bot. Cal. **1**: 300; Man. R. M. 143].

In cañons and badlands, up to an altitude of 2000 m.

MONTANA: Madison Cañon, 1886, *Tweedy, 1129;* Prickly Pear Cañon, 1880, *R. S. Williams, 223:* Missouri River, 1883, *Scribner, 71:* South Fork of Judith River, 1896, *Flodman, 816*.

* **Coleosanthus oblongifolius** (Nutt.) Kuntze, Rev. Gen. Pl. **1**: 328; *Brickellia oblongifolia* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 288 [Syn. Fl. 1^2: 104; Bot. Cal. **1**: 300].

A species with much smaller heads than those of the preceding and with oblong or sometimes lanceolate leaves and acute or mucronate bracts. It resembles somewhat *Kuhnia* in general habit. In gravelly soil, up to an altitude of 2000 m.

MONTANA: Beaver Head Co., 1888, *Tweedy, 217*.

Lacinaria punctata (Hook.) Kuntze, Rev. Gen. Pl. **1**: 349 [Ill. Fl. **3**: 316]; *Liatris punctata* Hook. Fl. Bor. Am. **1**: 306 [Syn. Fl. 1^2: 110; Man. R. M. 144].

Dry plains, up to an altitude of 2000 m.

MONTANA: Madison Co., 1886, *Tweedy, 1120;* Cinnabar, 1884, *164:* Bozeman, 1892, *W. S. Shaw:* Lewis and Clarke Co., *Mrs. Muth:* Great Falls, 1891, *R. S. Williams, 76;* Belt River, 1881, *76a;* Smith River, 1883, *Scribner, 69:* Helena, 1882, *Canby:* Musselshell, 1896, *Flodman, 817*.

Gutierrezia Sarothrae (Pursh) Britt. & Rusby, Trans. N. Y. Acad. Sci. **7**: 10 [Ill. Fl. **3**: 320]: *Solidago Sarothrae* Pursh, Fl. Am. Sept. 540; *Gutierrezia Euthamiae* Torr. & Gray, Fl. N. Am. **2**: 193 [Syn. Fl. 1^2: 115; Bot. Cal. **1**: 302; Man. R. M. 144].

On dry plains, up to an altitude of 1500 m.

Montana: Gardiner, 1885, *Tweedy, 734:* Lewis and Clarke Co., *Mrs. Muth;* Teton River, 1883, *Scribner, 73;* Billings, 1898, *Williams & Griffith:* Madison River, 1895, *Rydberg, 2797:* Yogo Baldy, 1896, *Flodman, 818.*

Grindelia squarrosa (Pursh) Dunal; DC. Prod. **5**: 315 [Ill. Fl. **3**: 321: Syn. Fl. 1^2: 118: Man. R. M. 145]: *Donia squarrosa* Pursh, Fl. Am. Sept. 559.

On dry prairies, up to an altitude of 2000 m.

Montana: Madison Co., 1886, *Tweedy, 1117:* Bozeman, 1892, *W. S. Shaw;* Silver Bow Co., *Mrs. Jennie H. Moore:* Great Falls, 1887, *R. S. Williams, 75:* Helena, 1891, *F. D. Kelsey:* Sun River Crossing, 1883, *Scribner, 72*, in part.

* **Grindelia perennis** A. Nelson, Bull. Torr. Bot. Club, **26**: 355.

Like *G. squarrosa*, but with narrower thinner, almost entire, glaucous leaves. In saline soil, at an altitude of 1000–1500 m.

Montana: Smith River, 1883, *Scribner, 72*, in part.

Grindelia nana Nutt. Trans. Am. Phil. Soc. (II.) **7**: 314 [Syn. Fl. 1^2: 119: Man. R. M. 145].

In dry soil, up to an altitude of 2000 m.

Montana: Madison Co., *Mrs. Flora McNulty.*

Chrysopsis villosa (Pursh) Nutt. Gen. **2**: 151 [Ill. Fl. **3**: 324; Syn. Fl. 1^2: 122: Bot. Cal. **1**: 309: Man. R. M. 145]; *Amellus villosus* Pursh, Fl. Am. Sept. 564.

In sand-draws and on sandy prairies, up to an altitude of 2500 m.

Montana: Pony, July 6, 1897, *Rydberg & Bessey, 5068:* Indian Creek, July 21, *5069;* Spanish Basin, June 23, *5070;* eastern Montana, 1884, *Tweedy, 150:* Gallatin Co., 1886, *1112;* Helena, 1891, *F. D. Kelsey.*

Yellowstone Park: 1884, *Tweedy, 149:* 1873, *Parry, 147.*

* **Chrysopsis Columbiana** Greene, Erythea, **2**: 95.

Resembles somewhat *C. villosa*, but the leaves are few, spreading or reflexed, and the pubescence more hispidulous. On hillsides.

Montana: Silver Bow Co., *Mrs. Jennie H. Moore:* Helena, 1883, *Scribner, 74a.*

Chrysopsis hispida (Hook.) Nutt. Trans. Am. Phil. Soc. (II.) **7**: 316 [Ill. Fl. **3**: 325]; *Diplopappus hispidus* Hook. Fl. Bor. Am. **2**: 22; *Chrysopsis villosa hispida* Gray, Syn. Fl. 1^2: 123 [Man. R. M. 145].

On sandy plains and hills, up to an altitude of 1000 m.

MONTANA: Great Falls, 1891, *R. S. Williams, 73.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 147.*

* Chrysopsis depressa.

Intricately branched, from a woody caudex; stems less than 1 dm. high, densely short-pilose, very leafy; leaves seldom over 1 cm. long, obovate or spatulate, on very short petioles, divaricate, densely grayish strigose; heads on naked peduncles about 1 cm. long, small, 7–10 mm. high; bracts linear, acute, puberulent, in about 3 rows, one-third shorter than the disk; achenes silky strigose.

A species belonging to the *C. villosa* group; distinguished by the tufted habit, small leaves and small pedunculate heads. On hot-spring formations.

YELLOWSTONE PARK: Lower Geyser Basin, August 4, 1897, *Rydberg & Bessey, 5067.*

* **Pyrrocoma carthamoides** Hook. Fl. Bor. Am. **1**: 307; *Aplopappus carthamoides* Gray, Proc. Acad. Sci. Phila. **1863**: 65 [Syn. Fl. **1**^{2}: 126].

Somewhat resembling *P. integrifolia* in habit, but with broad oblong to lanceolate and more or less mucronate-tipped leaves. Dry plains and hills, up to an altitude of 1500 m.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy, 16;* Ignatius Mission, 1883, *Canby, 167.*

Pyrrocoma integrifolia (Porter) Greene, Erythea, **2**: 69; *Aplopappus integrifolius* Porter; Gray, Proc. Am. Acad. **16**: 79 [Syn. Fl. **1**^{2}: 128; Man. R. M. 146].

Mountain meadows and hillsides, up to an altitude of 2000 m.

MONTANA: Deer Lodge, 1860, *Dr. Cooper;* Gallatin River, 1886, *Tweedy, 1115;* Beaver Head Co., 1888, *232;* Jack Creek, June 18, 1897, *Rydberg & Bessey, 5053;* Silver Bow Co., *Mrs. Jennie H. Moore*; Helena, 1887, *R. S. Williams, 708;* Judith Gap, 1882, *Canby;* Grasshopper Valley, 1880, *Watson, 1883;* Melrose, 1895, *Rydberg, 2809.*

Pyrrocoma lanceolata (Hook.) Greene, Erythea, **2**: 69; *Donia lanceolata* Hook. Fl. Bor. Am. **2**: 25; *Aplopappus lanceolatus* Torr. & Gray, Fl. N. Am. **2**: 241 [Syn. Fl. **1**^{2}: 129; Man. R. M. 147].

Plains and hillsides, up to an altitude of 1500 m.

MONTANA: Sun River, 1887, *R. S. Williams, 707.*

Pyrrocoma uniflora (Hook.) Greene, Erythea, **2**: 60; *Donia uniflora* Hook. Fl. Bor. Am. **2**: 25: *Aplopappus uniflorus* Torr. & Gray, Fl. N. Am. **2**: 241 [Syn. Fl. $\mathbf{1}^2$: 128; Man. R. M. 146].

In saline soils and around hot-springs, at an altitude of 2000–2500 m. All Montana and Yellowstone Park specimens are much smaller than Hooker's type and often with entire leaves.

MONTANA: Granite, 1892, *F. D. Kelsey*; Beaver Head Co., 1888, *Tweedy*, *231*: Grasshopper Valley, 1880, *Watson*, *184*.

YELLOWSTONE PARK: Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey*, *5050* and *5052*: Lone Star Geyser Basin, Aug. 7, *5051*: Hot Springs, Yellowstone Lake, 1884, *Tweedy*, *153*.

* **Pyrrocoma inuloides** (Nutt.) Greene, Erythea, **2**: 60; *Aplopappus inuloides* Torr. & Gray, Fl. N. Am. **2**: 241; *Aplopappus uniflorus* Gray, Syn. Fl. $\mathbf{1}^2$: 128, in part.

Like *P. uniflora*, but densely woolly. At an altitude of 2500 m.

YELLOWSTONE PARK: 1873, *C. C. Parry*, *149*.

* **Pyrrocoma Howellii** (Gray) Greene, Erythea, **2**: 70; *Aplopappus Howellii* Gray, Syn. Fl. $\mathbf{1}^2$: 446.

Like *P. uniflora*, but sericeous-tomentose when young, bracts rather obtuse and leaves subentire.

MONTANA: Butte, 1895, *Rydberg*, *2808*.

Pyrrocoma Lyallii (Gray): *Aplopappus Lyallii* Gray, Proc. Acad. Sci. Phila. **1863**: 64 [Syn. Fl. $\mathbf{1}^2$: 131; Man. R. M. 148].

It is with great hesitation that I refer this species to *Pyrrocoma*, as the habit is different, the pappus white, and the bracts rather thin. The bracts are foliaceous, not with the thin margin of *Stenotus* and the leaves are not evergreen. Hence placing it in *Stenotus* would not do. It was placed by Gray nearest *H. pygmaeus*, which Greene has referred to *Macronema*. The present species could not be referred there as it has neither the thick bracts nor the long style of that genus. It may be the type of a new genus, but my material is too meagre for a thorough study.

MONTANA: McDonald's Peak, Mission Range, 1883, *Canby*, *166*; Indian Creek, July 22, 1897, *Rydberg & Bessey*.

YELLOWSTONE PARK: 1885, *Tweedy*, *736*.

Stenotus caespitosus Nutt. Trans. Am. Phil. Soc. (II.) **7**: 335; *Aplopappus acaulis glabratus* Eaton, King's Exped. **5**: 161 [Syn. Fl. $\mathbf{1}^2$: 132; Man. R. M. 149].

On rocky hills, at an altitude of 1500–2500 m.

MONTANA: *Wyeth;* Bear Gulch, 1887, *Tweedy, 347;* Deer Lodge, 1888, *F. W. Traphagen;* Bridger Mountains, June 15 and 17, 1897, *Rydberg & Bessey, 5047* and *5049;* Clendennin, 1882, *R. S. Williams, 206.*

YELLOWSTONE PARK: 1884, *Tweedy, 127.*

IDAHO: Mount Chauvet, July 29, 1897, *Rydberg & Bessey, 5048.*

Stenotus acaulis Nutt. Trans. Am. Phil. Soc. (II.) **7**: 334; *Aplopappus acaulis* Gray, Proc. Am. Acad. **7**: 353 [Syn. Fl. **1**^{2}: 132; Bot. Cal. **1**: 311; Man. R. M. 148].

On rocky hills and mountains, at an altitude of 1500–2500 m.

MONTANA: *Wyeth;* Helena, 1890, *F. D. Kelsey;* Gallatin Co., 1888, *Tweedy, 30.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 162;* 1888, *Dr. Chas. H. Hall.*

Stenotus lanuginosus (Gray) Greene, Erythea, **2**: 72; *Aplopappus lanuginosus* Gray, U. S. Expl. Exped. **17**: 347 [Syn. Fl. **1**^{2}: 131; Man. R. M. 148].

In rocky places in the mountains.

MONTANA: Lewis and Clarke Co., 1890, *F. D. Kelsey;* Trail Creek Prairie, 1880, *Watson, 182.*

Oonopsis multicaulis (Nutt.) Greene, Pittonia, **3**: 45; *Stenotus multicaulis* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 335; *Aplopappus multicaulis* Gray, Am. Nat. **8**: 213 [Syn. Fl. **1**^{2}: 129; Man. R. M. 147].

In rocky places, up to an altitude of 2500 m.

YELLOWSTONE PARK: 1873, *C. C. Parry, 164.*

Eriocarpum grindelioides Nutt. Trans. Am. Phil. Soc. (II.) **7**: 321 [Ill. Fl. **3**: 328]: *Aplopappus Nuttallii* Torr. & Gray, Fl. N. Am. **2**: 242 [Syn. Fl. **1**^{2}: 125; Man. R. M. 146].

On dry hills and plains, up to an altitude of 1500 m.

MONTANA: Great Falls, 1891, *R. S. Williams, 69;* Snowy Mountains, 1882, *Canby;* Bull Mountain, 1882, *Canby.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 161.*

Eriocarpum spinulosum (Pursh) Greene, Erythea, **2**: 108 [Ill. Fl. **3**: 329]; *Amellus spinulosus* Pursh, Fl. Am. Sept. **2**: 564; *Aplopappus spinulosus* DC. Prod. **5**: 347 [Syn. Fl. **1**^{2}: 130; Man. R. M. 148].

On prairies, especially in sandy soil, up to an altitude of 2500 m.

Montana: Helena, 1890, *F. D. Kelsey;* Great Falls, 1885, *F. W. Anderson, 196;* Great Falls, 1891, *R. S. Williams, 57;* Dearborn River, 1883, *Scribner, 75.*

* Macronema grindelifolium.

A much-branched undershrub, 1–2 dm. high; young branches glandular-puberulent; leaves oblong or spatulate, more or less fleshy, 1–2 cm. long, obtuse or mucronate, finely glandular-puberulent, and with a more or less crisped margin; heads 1.5 cm. high, the bracts rather few, the outer ones foliaceous, oblanceolate, acute, mostly longer than the disk; rays 6–12, rather conspicuous, often 1 cm. long.

Nearest related to *M. suffruticosum*, which, however, differs in having narrowly oblanceolate acute leaves, which are 2–3 cm. long, shorter and fewer, if any, ray-flowers, and a longer pubescence. Grows among rocks, on the higher peaks, at an altitude of 2500–3000 m.

Montana: Gallatin Co., 1886, *Tweedy, 1114.*

Yellowstone Park: Sepulchre Mountain, 1884, *Tweedy, 179;* Electric Peak, August 18, 1897, *Rydberg & Bessey, 5045* (type); 1873, *C. C. Parry, 161.*

Wyoming: Sheep Mountain, 1897, *Tweedy, 552.*

Idaho: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5046.*

* Macronema lineare.

Perennial, with suffruticose base: stem erect, about 1.5 dm. high, finely white-tomentose; leaves numerous, linear, acute, glandular-puberulent, bright green; heads 1–1.5 cm. high, the bracts rather few, linear, somewhat foliaceous, but seldom equalling the disk; rays none.

A near relative of *M. discoideum*, but it is distinguished by the narrower and brighter green leaves, the more slender branches, the finer and more appressed tomentum, the smaller heads, and the shorter outer bracts. In sandy or gravelly places, at an altitude of about 2500 m.

Yellowstone Park: Elephant Back, 1885, *Tweedy, 722;* Shores of the Yellowstone, *723.*

Wyoming: Gros Ventre River, 1897, *Tweedy, 557* (type).

* **Chrysothamnus puberulus** (D. C. Eaton) Greene, Erythea, **3**: 93; *Linosyris viscidiflora puberula* Eaton, King's Exped. **5**: 157; *Bige-*

lovia Douglasii lanceolata Gray, Syn. Fl. 1²: 140, in part; *B. Douglasii puberula* Proc. Am. Acad. 8: 639 [Bot. Cal. 1: 318].

Like *C. viscidiflorus*, but the leaves narrower and puberulent. Dry plains and prairies, at an altitude of 1500–2500 m.

MONTANA: Gardiner, 1885, *Tweedy, 724.*

* **Chrysothamnus stenophyllus** (Gray) Greene, Erythea, 3: 94; *Bigelovia Douglasii stenophylla* Gray, Proc. Am. Acad. 8: 644 [Syn. Fl. 1²: 140].

Like *C. viscidiflorus*, but with linear almost filiform leaves which are generally spreading. Dry hills and benchlands, at an altitude of 1500–2000 m.

MONTANA: Logan, 1895, *Rydberg, 2803;* Fridley, Aug. 22, 1897, *Rydberg & Bessey, 5044a;* Billings, 1898, *Williams & Griffith;* Logan, 1895, *Rydberg, 2803.*

Chrysothamnus viscidiflorus (Hook.) Nutt. Trans. Am. Phil. Soc. (II.) 7: 324; *Crinitaria viscidiflora* Hook. Fl. Bor. Am. 2: 24; *Bigelovia Douglasii* Gray, Proc. Am. Acad. 8: 644 [Syn. Fl. 1²: 139; Bot. Cal. 1: 317; Man. R. M. 151].

Dry plains, at an altitude of 1000–1500 m.

MONTANA: Little Blackfoot River, 1860, *Cooper.*

Chrysothamnus viscidiflorus lanceolatus (Nutt.) Greene, Erythea, 3: 95; *Chrysothamnus lanceolatus* Nutt. Trans. Am. Phil. Soc. (II.) 7: 324; *Bigelovia Douglasii lanceolata* Gray, Syn. Fl. 1²: 140 [Man. R. M. 151].

On dry prairies and plains, at an altitude of 1000–2000 m.

MONTANA; Belt Mts., 1888, *R. S. Williams;* Helena, 1890, *F. D. Kelsey;* 1886, *Tweedy, 1136.*

Chrysothamnus nauseosus (Pursh) Britton, Mem. Torr. Bot. Club, 5: 317; *Chrysothamnus speciosus* Nutt. Trans. Am. Phil. Soc. (II.) 7: 323; *Bigelovia graveolens* Gray, Proc. Am. Acad. 8: 644 [Syn. Fl. 1²: 139; Bot. Cal. 1: 317; Man. R. M. 151].

On prairies and plains, at an altitude of 1500–2000 m.

MONTANA: Rainbow Falls, 1885, *R. S. Williams, 245;* Electric Peak, August 20, 1897, *Rydberg & Bessey, 5044;* 1886, *F. Tweedy, 1135;* Horse Plains, 1883, *H. B. Ayres, CCLXXXV.*

YELLOWSTONE PARK: 1892, *Mrs. Simonton.*

Chrysothamnus nauseosus albicaulis (Nutt.); *Chrysothamnus speciosus albicaulis* Nutt. Trans. Am. Phil. Soc. (II.) 7: 323; *Bige-*

lovia graveolens albicaulis Gray, Proc. Am. Acad. **8**: 644 [Syn. Fl. **1**^{2}: 139; Man. R. M. 151; Bot. Cal. **1**: 317].

On dry plains, up to an altitude of 1500 m.

MONTANA: Great Falls, 1886, *F. W. Anderson*, *197;* Teton River, 1883, *Scribner*, *74:* Missoula, 1898, *Williams & Griffiths.*

Chrysothamnus graveolens (Nutt.) Greene, Erythea, **3**: 108: *Crysocoma graveolens* Nutt. Gen. **2**: 136; *Bigelovia graveolens glabrata* Gray, Proc. Am. Acad. **8**: 644 [Syn. Fl. **1**^{2}: 139; Man. R. M. 151; Bot. Cal. **1**: 317].

On prairies and plains and in cañons, at an altitude of 1500–2000 m.

MONTANA: Gardiner, 1885, *Tweedy*, *725.*

Chrysothamnus pumilus Nutt. Trans. Am. Phil. Soc. (II.) **7**: 323; *Bigelovia Douglasii pumila* Gray. Syn. Fl. **1**^{2}: 140 [Man. R. M. 151].

Plains and valleys, at an altitude of about 2500 m.

MONTANA: Madison River, 1895. *Rydberg*, *2802.*

YELLOWSTONE PARK: 1884, *Tweedy*, *177.*

Solidago multiradiata Ait. Hort. Kew. **3**: 218 [Ill. Fl. **3**: 346; Man. R. M. 152]; *Solidago Virga-aurea multiradiata* Torr. & Gray, Fl. N. Am. **2**: 207 [Bot. Cal. **1**: 318].

Common in the mountains, at an altitude of 1500–2500 m.

MONTANA: Bear Gulch, 1887, *Tweedy*, *325a;* Silver Bow Co., *Mrs. Helen Dolman:* Yogo, 1888, *R. S. Williams*, *65:* Rimini, 1887, *F. D. Kelsey:* Upper Marias Pass and McDonald's Peak, 1883, *Canby*, *168* and *169:* Little Belt Mts., 1883, *Scribner*, *80;* Spanish Basin, 1896, *Flodman*, *822;* Little Belt Pass, *823* and *824.*

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey*, *5065;* 1884, *Tweedy*, *114;* 1885, *677.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *5066* and *5067* (a less pubescent form with narrower bracts).

Solidago decumbens Greene, Pittonia, **3**: 161; *Solidago humilis nana* Gray, Syn. Fl. **1**^{2}: 148, in part [Man. R. M. 153].

On the higher mountains, up to an altitude of about 3000 m.

MONTANA: Park Co., 1887, *Tweedy*, *325;* Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey*, *5053:* Lima, 1895, *Rydberg*, *2807:* Spanish Peaks, 1896, *Flodman*, *821.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *5064.*

* **Solidago ciliosa** Greene, Pittonia, **3**: 22.

Like *S. multiradiata*, but with dentate-ciliate bracts. The following specimen is doubtfully referred here:

MONTANA: Indian Creek, 1884, *Tweedy, 114.*

Solidago oreophila; *Solidago stricta* Hook. Fl. Bor. Am. **2**: 4, mainly, 1834; not Ait., 1789; *S. humilis* Gray, Syn. Fl. **1**^{2}: 148, partly, as to the Rocky Mountain plant [Man. R. M. 153]; not Pursh.

At an altitude of about 2000 m.

MONTANA: Gap in the Belt Mountains above White's Gulch, 1882, *Canby.*

Solidago Missouriensis Nutt. Journ. Acad. Sci. Phila. **7**: 32 [Ill. Fl. **3**: 343; Syn. Fl. **1**^{2}: 155; Man. R. M. 154].

On prairies and plains, up to an altitude of 2500 m.

MONTANA: Helena, 1890, *F. D. Kelsey;* Indian Creek, July 21, 1897, *Rydberg & Bessey, 5060;* Pony, July 6, *5061;* Wolf Creek, July 24, *5062;* Forks of the Madison, July 26, *5063;* Silver Bow Co., *Mrs. Jennie H. Moore;* Great Falls, 1891, *R. S. Williams, 864;* Helena, 1883, *Scribner, 81a;* Teton River, *81;* Ft. Ellis to the Yellowstone, 1871, *Hayden Survey;* Lima, 1895, *Rydberg, 2805;* Logan, *2806.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 678;* 1884, *111* and *116;* 1883, *Miss Mary Compton.*

Solidago Missouriensis extraria Gray, Proc. Am. Acad. **18**: 196 [Syn. Fl. **1**^{2}: 156; Man. R. M. 154].

In valleys, at an altitude of about 2000 m.

MONTANA: Madison Co., 1886, *Tweedy, 1123.*

Solidago serotina Ait. Hort. Kew. **3**: 211 [Ill. Fl. **3**: 342; Syn. Fl. **1**^{2}: 156; Man. R. M. 154].

In valleys, up to an altitude of 2500 m.

MONTANA: Wolf Creek, July 24, 1897, *Rydberg & Bessey, 5058;* Forks of the Madison, July 27, *5059;* West Boulder, 1887, *Tweedy, 327;* Swimming Woman Creek, 1882, *Canby.*

Solidago Canadensis L. Sp. Pl. 878 [Ill. Fl. **3**: 344; Syn. Fl. **1**^{2}: 157; Man. R. M. 154].

In river-valleys and meadows, up to an altitude of 2000 m.

MONTANA: Madison Co., *Mrs. L. A. Fitch;* Belt Mts., 1883, *Scribner, 86;* East Gallatin Swamps, 1896, *Flodman, 820.*

Solidago procera Ait. Hort. Kew. **3**: 211; *Solidago Canadensis procera* Torr. & Gray, Fl. N. Am. **2**: 224 [Ill. Fl. **3**: 344: Syn. Fl. **1**^{2}: 157; Man. R. M. 154].

In river-valleys, up to an altitude of 1500 m.

MONTANA: Little Rocky Mts., 1889, *Dr. V. Havard;* Teton River, 1883, *Scribner, 84.*

Solidago elongata Nutt. Trans. Am. Phil. Soc. (II.) **7**: 327 [Syn. Fl. **1**^{2}: 157: Bot. Cal. **1**: 319; Man. R. M. 154].

In valleys, at an altitude of 1500–2000 m.

MONTANA: Cliff Lake, July 27, 1897, *Rydberg & Bessey, 5056;* Forks of the Madison, *5057;* Smith River, 1883, *Scribner, 85.*

YELLOWSTONE PARK: Lone Star Geyser Basin, Aug. 7, 1897, *Rydberg & Bessey, 5055;* Mammoth Hot Springs, 1884, *Tweedy, 113;* 1885, *679.*

Solidago pulcherrima A. Nelson, Bull. Torr. Bot. Club, **25**: 549; *Solidago diffusa* A. Nelson, Bull. Torr. Bot. Club, **25**: 378; not A. Gray; *Solidago nemoralis* Gray, Syn. Fl. **1**^{2}: 158, in part, as to the western plant [Man. R. M. 155]: not Ait.

Differs from the eastern *S. nemoralis* in the smaller leaves and heads, the shorter panicles and the finer pubescence. It grows on plains and dry prairies, up to an altitude of 2000 m.

MONTANA: Teton River, 1883, *Scribner, 82.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 115.*

Solidago nana Nutt. Trans. Am. Phil. Soc. (II.) **7**: 327 [Syn. Fl. **1**^{2}: 158; Man. R. M. 155].

On dry hills, at an altitude of 1500–2500 m.

MONTANA: Bridger Creek, 1887, *Tweedy, 326; F. W. Anderson.*

YELLOWSTONE PARK: Lone Star Geyser Basin, Aug. 7, 1897, *Rydberg & Bessey, 5054.*

Solidago mollis Bartl. Ind. Sem. Goett. 5 [Ill. Fl. **3**: 344]; *Solidago incana* Torr. & Gray, Fl. N. Am. **2**: 221; *S. nemoralis incana* Gray, Proc. Am. Acad. **17**: 197 [Syn. Fl. **1**^{2}: 158; Man. R. M. 155].

Dry plains, up to an altitude of 1500 m.

MONTANA: Little Rocky Mts., 1889, *V. Havard;* Dog Creek, 1887, *R. S. Williams, 260;* Smith River, 1883, *Scribner, 78.*

Solidago rigida L. Sp. Pl. 880 [Ill. Fl. **3**: 345; Syn. Fl. **1**^{2}: 159; Man. R. M. 155].

Plains, prairies and river-valleys, up to an altitude of 1500 m.

MONTANA: Bozeman, 1884, *Tweedy, 146;* 1886, *1123;* Livingston, 1892, *F. D. Kelsey;* Snowy Mountains, 1882, *Canby.*

Euthamia occidentalis Nutt. Trans. Am. Phil. Soc. (II.) **7**: 326; *Solidago occidentalis* Nutt.; Torr. & Gray, Fl. N. Am. **2**: 226 [Bot. Cal. **1**: 318; Man. R. M. 155].

River valleys, at an altitude of 1000–2000 m.

MONTANA: 1887, *F. W. Anderson;* Great Falls, 1891, *R. S. Williams, 244;* Banks of the Yellowstone at Huntley, 1882, *Canby.*

Euthamia graminifolia (L.) Nutt. Gen. **2**: 162 [Ill. Fl. **3**: 347]; *Chrysocoma graminifolia* L. Sp. Pl. 841; *Solidago lanceolata* L. Mant. 144 [Syn. Fl. **1**^{2}: 161; Man. R. M. 157].

In valleys and meadows, up to an altitude of 1500 m.

MONTANA: Swimming Woman Creek, 1882, *Canby.*

Townsendia Parryi D. C. Eaton, Am. Nat. 8: 212 [Syn. Fl. **1**^{2}: 167; Man. R. M. 156].

Common in the mountains, at an altitude of 1500–3000 m.

MONTANA: Helena, 1889, *F. D. Kelsey;* Gallatin Co., 1888, *Tweedy, 228; Mrs. Hodgman;* Lewis & Clarke Co., *Mrs. Murphy;* Bridger Mts., 1892, *W. T. Shaw;* Lima, 1895, *Rydberg, 2812;* Little Belt Mts., 1896, *Flodman, 828;* Bozeman, 1887, *Tweedy, 378;* 1882, *400;* Helena, 1887, *F. W. Anderson;* Deer Lodge, 1895, *Rydberg, 2810;* Spanish Basin, 1896, *Flodman, 825* and *827;* Bridger Mts., July 11, 1897, *Rydberg & Bessey, 5132;* Sheridan, 1892, *Mrs. Fitch;* Upper Sand Coulee, 1888, *R. S. Williams, 35;* Belt Mountains, 1883, *Scribner, 76;* Mystic Lake, and Big Blackfoot and Jocko Rivers, 1883, *Canby, 176;* Deer Lodge, 1895, *Rydberg, 2810;* Lima, *2812;* Terminus, 1880, *Watson;* Bannock City, *Watson.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Mammoth Hot Springs, 1894, *F. H. Burglehaus, 126;* Mt. Holmes, 1884, *Tweedy, 157.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5133.*

Townsendia florifera (Hook.) Gray, Proc. Am. Acad. **16**: 84 [Syn. Fl. **1**^{2}: 168; Man. R. M. 157; Bot. Cal. **2**: 455]; *Erigeron florifer* Hook. Fl. Bor. Am. **2**: 20.

In the mountains, at an altitude of 2500–3000 m.

YELLOWSTONE PARK: 1884, *F. Tweedy, 158.*

Townsendia alpina (Gray); *Townsendia Parryi alpina* Gray, Proc. Am. Acad. **16**: 83 [Syn. Fl. 1^2: 167; Man. R. M. 156].

On high mountains, at an altitude of nearly 3000 m.

Montana: Madison Co., 1888, *Tweedy, 229.*

Yellowstone Park: Yellowstone and Stinking Water, 1873, *C. C. Parry, 143* and *145.*

* **Townsendia scapigera** D. C. Eaton, King's Exped. **5**: 145 [Syn. Fl. 1^2: 168: Bot. Cal. **2**: 455].

With somewhat the habit of the next, but not sericeous; leaves broadly spatulate and the bracts oblong, often tinged with purple. On the tops of the higher mountains, at an altitude of 2500–3000 m.

Montana: Madison Co., 1887, *Tweedy;* Warm Spring Creek, *379;* Gallatin Co., 1886.

Yellowstone Park: Mt. Holmes, 1884, *Tweedy.*

Idaho: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5131.*

Townsendia exscapa (Richards.) Porter, Mem. Torr. Bot. Club, **5**: 321 [Ill. Fl. **3**: 351]: *Aster* (?) *exscapus* Richards. Frankl. Journ. Ed. 2, App. 32; *Townsendia sericea* Hook. Fl. Bor. Am. **2**: 16 [Syn. Fl. 1^2: 168; Man. R. M. 157].

On dry plains and hills, up to an altitude of 2000 m.

Montana: Deer Lodge, 1888, *F. W. Traphagen;* Helena, 1889, *F. D. Kelsey;* Gallatin Co., 1888, *Tweedy, 20;* Deer Lodge, 1892, *W. T. Shaw:* Great Falls, 1886, *F. W. Anderson, 203;* Bozeman, 1882, *Tweedy, 405;* Helena, 1892, *F. D. Kelsey;* Great Falls, 1886, *R. S. Williams, 84;* Mt. Helena, 1883, *Canby, 177.*

Yellowstone Park: 1885, *Tweedy, 697.*

Aster Richardsonii Spreng. Syst. **3**: 528; *Aster montanus* Richards. Frankl. Journ. 749, 1821; not All., 1755; *Aster Sibiricus* Gray, Syn. Fl. 1^2: 176 [Man. R. M. 158]; not L.

Wooded hills and mountain-sides, at an altitude of 2000–2800 m.

Montana: Long Baldy, 1896, *Flodman, 834;* Upper Marias Pass, 1883, *Canby, 174a;* Flathead River, *174.*

Yellowstone Park: 1873, *C. C. Parry, 129;* Mammoth Hot Springs, 1884, *Tweedy, 135;* Pelican Creek, 1885, *748.*

Aster conspicuus Lindl.; Hook. Fl. Bor. Am. **2**: 7 [Syn. Fl. 1^2: 177; Man. R. M. 159].

In mountain woods, at an altitude of 1000–2500 m.

Montana: Little Rocky Mts., 1889, *Dr. V. Havard;* Bear Creek Cañon, 1892, *W. T. Shaw;* Columbia Falls, *Mrs. J. J.*

Kennedy, *15* and *21*; Park Co., 1887, *Tweedy*, *357*; Emigrant Gulch, Aug. 22, 1897, *Rydberg & Bessey*, *5129*; Electric Peak, Aug. 20, *5130*; Belt Park, 1886, *R. S. Williams*, *226*; Bitter Root River, 1860, *Cooper*; Smith River, 1883, *Scribner*, *87*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *F. Tweedy*, *134*; 1873, *C. C. Parry*, *130*.

Aster integrifolius Nutt. Trans. Am. Phil. Soc. (II.) **7**: 291 [Bot. Cal. **1**: 324; Syn. Fl. 1^2: 177; Man. R. M. 159].

In woods, at an altitude of 1500–2500 m.

MONTANA: Bozeman, 1895, *Rydberg*, *2820*; Belt Park, 1886, *R. S. Williams*, *435*.

YELLOWSTONE PARK: 1884, *Tweedy*, *141*; Upper Geyser Basin, Aug. 8, 1897, *Rydberg & Bessey*, *5127*; 1873, *C. C. Parry*, *131*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *5125*.

* Aster amplexifolius.

Perennial, from a rootstock, ascending at the base, stout, about 4 dm. high, viscid-hirsute, especially on the upper portion; basal leaves oblanceolate, about 1.5 dm. long, tapering into a winged petiole, entire, rather firm, in age glabrate above, ciliate on the margins and on the veins beneath: stem-leaves ovate, clasping; heads rather few, 12–14 mm. high, and nearly 2 cm. in diameter; bracts very unequal, more or less leafy, oblong, acute or the inner linear-lanceolate, viscid-hirsute; rays numerous, narrow, about 8 mm. long.

It has been taken for *A. integrifolius*, which it resembles in habit, and it may be nearest related to that species, but differs in the foliaceous bracts, the ampler more clasping stem-leaves, and more hirsute stem. It grows on plains.

MONTANA: Headwaters of Jocko River, 1883, *Canby*, *170*.

Aster campestris Nutt. Trans. Am. Phil. Soc. (II.) **7**: 293 [Syn. Fl. 1^2: 178; Man. R. M. 158].

Dry benches and meadows, at an altitude of 2000–2500 m.

MONTANA: Madison Co., 1886, *Tweedy*, *1148*; Smith River, 1883, *Scribner*, *95*.

YELLOWSTONE PARK: 1884, *Tweedy*, *143*; Mammoth Hot Springs, *145*.

* **Aster major** (Hook.) Porter, Mem. Torr. Bot. Club, **5**: 325 [Ill. Fl. **3**: 367]; *Aster Unalaschensis major* Hook. Fl. Bor. Am. **2**: 7; *A. modestus* Lindl.; Hook. l. c. 8 [Syn. Fl. 1^2: 179].

A tall plant with thin lanceolate leaves, and with long slender acuminate purplish bracts. It grows in meadows and river-valleys, at an altitude of 1000–2000 m.

MONTANA: Silver Bow Co., *Mrs. Jennie Moore;* West Gallatin, 1892, *W. T. Shaw;* Columbia Falls, *Mrs. J. J. Kennedy, 3, 10* and *20;* Bozeman Cañon, 1897, *H. S. Jennings;* Garrison, 1895, *Rydberg, 2819;* Madison Co., 1886, *Tweedy, 1144;* Belt Mts., 1884, *R. S. Williams, 224;* Garrison, 1895, *Rydberg, 2819.*

***Aster Lindleyanus** Torr. & Gray, Fl. N. Am. **2**: 122 [Ill. Fl. **3**: 364; Syn. Fl. **1**^{2}: 182].

A tall species with the lower leaves cordate and the upper ovate or ovate-lanceolate, coarsely serrate, and acuminate at both ends; petioles wing-margined, and the bracts very narrow. In meadows.

MONTANA: Sand Coulee, 1891, *R. S. Williams, 232;* Flathead Lake, 1883, *Canby, 171* (?); Judith Mts., 1881.

* Aster ciliomarginatus.

Perennial; stem 3–6 dm. high, terete, slightly striate and tinged with red, glabrous below, more or less strigose above; basal leaves glabrous except the ciliolate margins, thin, distantly serrate or subentire, 1–2 dm. long, oblanceolate, acute, tapering into wing-margined petioles; lower stem-leaves similar, but with shorter petioles, somewhat clasping, the upper oblong or lanceolate, sessile; panicle open; heads about 1 cm. high and 12–15 mm. in diameter; bracts linear, ciliate on the margins, upper part foliaceous and the outer somewhat spreading; rays numerous, about 12 mm. long, light blue; pappus tinged with reddish.

A species of the *laevis* group, characterized by the thin ciliolate leaves and the strigose upper part of the stem. It grows in open woods, at an altitude of 2000 m.

MONTANA: Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 5128* (type); Columbia Falls, *Mrs. Kennedy, 11* and *13;* Bear Creek Cañon, 1892, *W. F. Shaw;* Little Belt Mts., 1896, *Flodman, 831.*

*Aster brevibracteatus.

Perennial; stem 5–6 dm. high, terete, glabrous, shining, tinged with purple; basal leaves spatulate or ovate-lanceolate, tapering into a winged petiole about 1 dm. long, coarsely crenate, firm and somewhat pale, glabrous; lower stem-leaves similar, the middle ones oblong or oblanceolate, sessile, with an auricled base, the upper lanceolate, half-clasping; lower bracts of the inflorescence 1–3 cm. long, the upper very small, ovate-lanceolate; heads 8–10 mm. high, hemispheric; bracts in about four rows, imbricated, linear-lanceolate, rather firm, with a narrowly rhomboid foliaceous tip, the inner ones two-thirds or three-fourths the length of the disk-flowers; rays narrow, numerous, blue.

Apparently nearest related to *A. laevis Geyeri*, but differs in the short bracts and the form of the leaves, which in the present species are more strongly crenate. In low grounds and open woods.

WASHINGTON: Spokane Co., 1889, *Suksdorf*, *928* (type).

MONTANA: Missouri River, 1892, *F. D. Kelsey;* northern Montana, *F. W. Anderson;* Sun River Crossing, 1883, *Scribner*, *93;* Teton River, *92*.

* Aster Scribneri.

Stem 3–6 dm. high, simple, striate, glabrous; basal leaves and lower stem-leaves petioled, the petiole 3–10 cm. long, wing-margined, clasping and somewhat auricled at the base; blade 8–14 cm. long, 3.5–6 cm. wide, thin, ovate, acute, sharply serrate-dentate, glaucous, glabrous, except the ciliate margins; stem-leaves ovate, or ovate-lanceolate, sessile and clasping; panicle small, with 5–10 heads about 1 cm. high; bracts unequal, imbricated, glabrous, lanceolate with a green midrib and narrowly rhomboid green tips, the outer about half as long as the inner; rays 14–18, rather wide, about 8 mm. long; pappus sordid, scabrous.

This belongs to the *laevis* group, but is easily distinguished by its large ciliate leaves. Grows on rocky slopes, at an altitude of 1300–2000 m.

MONTANA: Bird Tail Creek, 1883, *Scribner*, *91* (type); Gap of Belt Mountain, 1882, *Canby* (both in the Canby Herbarium).

Aster multiflorus Ait. Hort. Kew. **3**: 203 [Ill. Fl. **3**: 381; Syn. Fl. **1**^{2}: 185; Man. R. M. 161].

On prairies and in river-valleys, up to an altitude of 2500 m.

MONTANA: Silver Bow Co., *Mrs. Christie;* Belt River, 1887, *R. S. Williams*, *710;* Sun River, 1883, *Scribner*, *96;* Smith River, *97*.

YELLOWSTONE PARK: 1883, *Mary Compton*.

Aster incanopilosus (Lindl.) Sheldon, Bull. Torr. Bot. Club, **20**: 286 [Ill. Fl. **3**: 381]; *Aster ramulosus incano-pilosus* Lindl. in DC. Prod. **5**: 243; *A. commutatus* Gray, Syn. Fl. **1**^{2}: 185 [Man. R. M. 161].

On plains and river-banks, up to an altitude of 2500 m.

MONTANA: Park Co., 1887, *Tweedy*, *359;* Columbia Falls, *Mrs. J. J. Kennedy*, *58* and *59;* Gallatin Co., *Mrs. Hodgman;* Lewis and Clarke Co., *Mrs. Muth:* Madison Co., 1886, *Tweedy, 1145;* Lower Sand Coulee, 1891, *R. S. Williams, 227;* Cutbank Creek, 1882, *R. M. Springer, LXVIII.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 140.*

Aster salicifolius Lam. Encycl. Meth. **1**: 306 [Ill. Fl. **3**: 377: Syn. Fl. 1^2: 188; Man. R. M. 161].

On river-banks, up to an attitude of 2000 m.

MONTANA: Helena, 1889, *F. D. Kelsey.*

Aster longifolius Lam. Encycl. Meth. **1**: 306 [Ill. Fl. **3**: 371; Syn. Fl. 1^2: 188; Man. R. M. 162].

In river-valleys, up to an altitude of 2500 m.

MONTANA: Lima, 1895, *Rydberg, 2818:* Melrose, *2817;* Emigrant Gulch, Aug. 22, 1897, *Rydberg & Bessey, 5121;* Teton River, 1883, *Scribner, 94;* Melrose, 1895, *Rydberg, 2817;* Lima, *2818.*

YELLOWSTONE PARK: 1884, *Tweedy, 139.*

Aster junceus Ait. Hort. Kew. **3**: 204 [Ill. Fl. **3**: 370; Syn. Fl. 1^2: 188; Man. R. M. 161].

In wet meadows, up to an altitude of 1500 m.

MONTANA: East Gallatin Swamps, 1896, *Flodman, 833.*

Aster borealis Provancher, Fl. Can. **1**: 308; *Aster laxifolius borealis* Torr. & Gray, Fl. N. Am. **2**: 138; *Aster junceus* Gray, Syn. Fl. 1^2: 188, in part [Man. R. M. 161, in part].

MONTANA: Silver Bow Co., *Mrs. Helen Dolman; Mrs. Ida Christie.*

* Aster subracemosus.

Perennial, from a rootstock: stem 5–6 dm. high, simple, strict, sparingly strigose, terete; leaves oblanceolate or linear, or the upper lanceolate, sessile, 4–8 cm. long, more or less scabrous, especially on the margins, entire; inflorescence falsely racemose, often over 2 dm. long: heads about 1 cm. high, on bracted branchlets, 2–3, seldom 4, cm. long: bracts imbricated in several series, hirsute-ciliate, especially on the margins, the outer short, spatulate and acute, and somewhat spreading, the inner lanceolate and acute, all rather thick and with a greenish tip.

Probably nearest related to *A. adscendens*, for which it has been mistaken, but its strict and simple habit, falsely racemose inflorescence, and shorter and broader more strongly ciliate bracts easily distinguish it from that species. The inflorescence resembles somewhat that of *A. incanopilosus.* It grows on dry bench-lands and rocky hillsides, at an altitude of 1500–2000 m.

MONTANA: Helena, 1890, *Kelsey* (type); Fridley, 1887, *Tweedy, 352;* Bird Tail Creek, 1883, *Scribner, 89;* Eunis, 1886, *Tweedy, 1141*, in part.

Aster adscendens Lindl.; Hook. Fl. Bor. Am. **2**: 8 [Ill. Fl. **3**: 370: Syn. Fl. **1**^{2}: 191: Bot. Cal. **1**: 324: Man. R. M. 162].

Very variable as now understood, and the specimens here cited may represent three or four species. In dry soil, up to an altitude of 1000–2000 m.

MONTANA: Sand Coulee, 1891, *R. S. Williams, 229;* Snowy Mts., 1882, *Canby.*

YELLOWSTONE PARK: Yellowstone Lake, 1885, *Tweedy, 740* and *741;* Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 2120:* Mammoth Hot Springs, 1885, *Tweedy, 740:* 1884, *144.*

Aster andinus Nutt. Trans. Am. Phil. Soc. (II.) **7**: 290 [Syn. Fl. **1**^{2}: 191; Man. R. M. 162].

On the higher mountains, up to an altitude of nearly 3000 m.

YELLOWSTONE PARK: 1873, *C. C. Parry, 123;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 5119;* Hoodoo Peak, 1897, *P. Koch, 15.*

* **Aster subspathulatus**; *Aster spathulatus* Lindl.: DC. Prod. **5**: 231, 1836 [Syn. Fl. **1**^{2}: 191]; not Lag., 1832.

Resembles somewhat *A. Fremontii*, but has larger heads, and few very long thin oblanceolate or spatulate leaves. Grows in wet shady places among bushes, at an altitude of about 2500 m.

MONTANA: Jack Creek, July 15, 1897, *Rydberg & Bessey, 5117.*

YELLOWSTONE PARK: Upper Falls, Aug. 14, 1897, *Rydberg & Bessey, 5118.*

Aster Fremontii (Torr. & Gray) Gray, Syn. Fl. **1**^{2}: 191 [Man. R. M. 162]; *Aster adscendens Fremontii* Torr. & Gray, Fl. N. Am. **2**: 503.

In shady places, open woods, etc., at an altitude of 2000–2500 m.

MONTANA: Bozeman, 1884, *Tweedy, 131;* Spanish Basin, June 30, 1897, *Rydberg & Bessey, 5124;* Meadow Creek, 1886, *Tweedy, 1146;* Upper Marias Pass, 1883, *Canby, 171;* Flathead River, *171a;* East Boulder, 1887, *Tweedy, 354;* Missouri River, 1882, *Canby;* Belt Mts., 1882, *Canby.*

YELLOWSTONE PARK: Upper Geyser Basin, Aug. 8, 1897, *Rydberg & Bessey, 5123;* Mammoth Hot Springs, 1894, *Burglehaus* (a tall specimen with very narrow leaves); Upper Geyser Basin, 1872, *Coulter.*

* **Aster Oreganus** Nutt.: Torr. & Gray, Fl. N. Am. **2**: 163 [Syn. Fl. **1**^{2}: 192]: *Tripolium Oreganum* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 296.

Resembles somewhat the following three species, but has numerous small heads, 6–8 mm. high.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy, 27.*

* **Aster Douglasii** Lindl.: DC. Prod. **5**: 239 [Syn. Fl. **1**^{2}: 192: Bot. Cal. **1**: 324].

Resembles the next, but has more numerous and somewhat smaller heads and narrowly lanceolate leaves.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy, 26;* Smith River, 1883, *Scribner, 90;* White Gulch, Belt Mts., 1882, *Canby.*

Aster foliaceus Lindl.: DC. Prod. **5**: 228 [Ill. Fl. **3**: 371; Syn. Fl. **1**^{2}: 193: Man. R. M. 163].

On river-banks and wet places among bushes, at an altitude of 2000–2500 m.

MONTANA: Madison Co., 1886, *Tweedy, 1146* (in part) and *1149;* East Boulder, 1887, *353;* Park Co., *355.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 5116.*

Aster foliaceus Eatoni Gray, Syn. Fl. **1**^{2}: 194 [Man. R. M. 164].

Along streams, at an altitude of about 1500 m.

MONTANA: Box Elder Creek, 1887, *R. S. Williams, 236a.*

Aster frondeus (Gray) Greene, Proc. Acad. Sci. Phila. **1895**: 551: *Aster foliaceus frondeus* Gray, Syn. Fl. **1**^{2}: 193 [Man. R. M. 163].

In open woods and on river-banks, at an altitude of 2000–2500 m.

MONTANA: Sweet Grass Cañon, 1896, *Flodman, 830.*

YELLOWSTONE PARK: 1884, *Tweedy, 138.*

Aster apricus (A. Gray): *Aster foliaceus apricus* Gray, Syn. Fl. **1**^{2}: 193 [Man. R. M. 163].

On the highest mountains, at an altitude of 2500–3000 m.

MONTANA: Yogo Baldy, 1896, *Flodman, 832;* Park Co., 1887, *Tweedy, 356.*

YELLOWSTONE PARK: 1884, *Tweedy, 137.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5115.*

Ionactis stenomeres (Gray) Greene, Pittonia, **3**: 246; *Aster stenomeres* Gray, Proc. Am. Acad. **17**: 209 [Syn. Fl. **1**^{2}: 198; Man. R. M. 164].

Dry mountain ranges, at an altitude of about 2000 m.

MONTANA: Beaver Head Co., 1888, *F. Tweedy, 14;* Silver Bow Co., *Mrs. Ida Christie;* Rattlesnake Creek, 1888, *Tweedy, 14;* Sweetwater Basin, Beaver Head Co., 1888, *236;* Big Hole Valley, 1880, *Watson.*

Ionactis alpina (Nutt.) Greene, Pittonia, **3**: 245; *Diplopappus alpinus* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 304; *Aster scopulorum* Gray, Proc. Am. Acad. **16**: 98 [Syn. Fl. **1**^{2}: 198; Man. R. M. 164].

On very dry hills, at an altitude of 1500–2500 m.

MONTANA: *Wyeth;* Silver Bow Co., 1890, *F. D. Kelsey;* Deer Lodge, 1888, *F. W. Traphagen;* Beaver Head Co., 1888, *Tweedy, 236;* Melrose, 1895, *Rydberg, 2815;* Gardiner, 1885, *Tweedy, 744;* Boulder River, 1883, *Scribner, 97a;* Blackfoot River, 1883, *Canby, 175;* Big Hole Valley, 1880, *Watson.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Mammoth Hot Springs, 1885, *Tweedy, 744,* in part; Stinking Water, 1871, *Hayden Survey.*

Eucephalus Engelmanni (D. C. Eaton) Greene, Pittonia, **3**: 54; *Aster elegans Engelmanni* D. C. Eaton, King's Exped. **5**: 144; *A. Engelmanni* Gray, Syn. Fl. **1**^{2}: 199 [Man. R. M. 165].

On mountain-sides, at an altitude of 2500–3000 m.

MONTANA: Mill Creek, 1887, *Tweedy, 358;* Flathead River, 1883, *Canby, 173.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 134;* 1884, *Tweedy, 132;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 5114.*

Eucephalus elegans Nutt. Trans. Am. Phil. Soc. (II.) **7**: 298; *Aster elegans* Torr. & Gray, Fl. N. Am. **2**: 159 [Syn. Fl. **1**^{2}: 200; Man. R. M. 165].

On mountain-sides and dry ridges, at an altitude of 2000–2500 m.

MONTANA: Madison Co., 1886, *Tweedy, 1143.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 133;* 1885, *G. W. Letterman;* 1884, *Tweedy, 142;* Electric Peak, August 18, 1897, *Rydberg & Bessey, 5112.*

IDAHO: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 5113.*

Oreastrum Haydeni (Porter); *Aster pulchellus* D. C. Eaton, King's Exped. **5**: 143, 1871 [Syn. Fl. 1^2: 201; Man. R. M. 166]; not Willd., 1800: *Aster Haydeni* Porter; Hayden, Geol. Rep. **1871**: 485.

Dr. Gray included two distinct species in *A. pulchellus*, viz., *Oreastrum alpigenum* (Torr. & Gray) Greene, with larger heads and broadly oblanceolate leaves, and the present species, with linear leaves. It grows on the higher mountains, at an altitude of nearly 3000 m.

MONTANA: Park Co., 1887, *F. Tweedy, 351;* Cook City, 1891, *Mrs. M. L. Alderson;* Lake Plateau, 1897, *P. Koch, 37:* Little Belt Mountains, 1883, *Scribner, 88.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 127:* 1884, *Tweedy, 133.*

Machaeranthera tanacetifolia (H.B.K.) Nees, Gen. & Sp. Ast. 225 [Ill. Fl. **3**: 384]; *Aster tanacetifolius* H.B.K. Nov. Gen. & Sp. **4**: 95 [Syn. Fl. 1^2: 206; Bot. Cal. **1**: 322; Man. R. M. 168].

On dry prairies, up to an altitude of 2500 m.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall.*

Machaeranthera canescens (Pursh) Gray, Pl. Wright. **2**: 75; *Aster canescens* Pursh, Fl. Am. Sept. 547 [Syn. Fl. 1^2: 206: Bot. Cal. **1**: 322; Man. R. M. 167].

Dry plains and sandy soil, up to an altitude of 2500 m.

MONTANA: Bozeman, 1895, *Rydberg, 2814.*

YELLOWSTONE PARK: Yellowstone Lake, 1885, *Tweedy, 742;* Yellowstone Falls, Aug. 13, 1897, *Rydberg & Bessey, 5109: C. C. Parry, 132.*

* **Machaeranthera leucanthemifolia** Greene, Pittonia, **3**: 61: *Aster leucanthemifolius* Greene, Erythea, **3**: 119.

Like the preceding, but taller, and apparently glaucous, but really finely puberulent under a lens: leaves spatulate, coarsely and deeply serrate. On hills and bench-lands, up to an altitude of 2000 m.

MONTANA: Silver Bow Co., *Mrs. J. H. Moore:* Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 5110;* Cliff Lake, *5111;* Great Falls, 1891, *R. S. Williams, 155.*

* Machaeranthera linearis.

Perennial; stem about 1.5 dm. high, finely grayish pubescent, more or less tinged with purple, strict, terete and slightly striate;

leaves linear, 2–5 cm. long and about 2 mm. wide, finely strigose-puberulent, distantly sinuose-denticulate; panicle simple, its 5–7 heads 7–9 mm. high and about the same in diameter, somewhat turbinate; bracts oblong-lanceolate, acuminate, puberulent, more or less tinged with red or purple and with a greenish median line and tip, comparatively thin and only moderately spreading; rays 5–7 mm. long, rose or light purple; pappus tawny; achenes finely strigose.

This is a somewhat abnormal species of *Machaeranthera*, on account of its thin and less-spreading involucral bracts, and in this respect fully agrees with *M. Shastensis* (Gray) Greene. In fact, the two species agree so perfectly in the size and form of the heads and the rays, the form, structure and coloration of the bracts, etc., that it is impossible to distinguish them by the heads alone. The difference is in the stem and leaves. *M. linearis* is a much stricter plant, and its leaves are narrowly linear, acute and denticulate, while those of *M. Shastensis* are broadly spatulate, entire and mostly obtuse. Grows at an altitude of 2500 m.

YELLOWSTONE PARK: Aug. 6, 1885, *G. W. Letterman* (type, in the Herbarium of Columbia University).

Erigeron simplex Greene, Fl. Fran. 387; *Erigeron uniflorus* Hook. Fl. Bor. Am. **2**: 17, in part [Ill. Fl. **3**: 385; Syn. Fl. $\mathbf{1}^2$: 207; Bot. Cal. **1**: 327; Man. R. M. 168]; not L.

Differs from the European and Arctic species in the broad white pink or light purple rays and the white-woolly involucre. It grows on alpine peaks, at an altitude of about 3000 m.

MONTANA: Park Co., 1887, *Tweedy, 368;* Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 5105;* Indian Creek, July 22, *5106;* Mt. Blackmore, 1886, *Tweedy, 1141;* McDonald's Peak, 1883, *Canby, 182;* Little Belt Mts., 1883, *Scribner, 99;* Spanish Peaks, 1896, *Flodman, 835.*

YELLOWSTONE PARK: Mt. Holmes, 1884, *Tweedy, 122;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 5107;* 1885, *Tweedy, 703.*

Erigeron salsuginosus Gray, Proc. Am. Acad. **16**: 93 [Syn. Fl. $\mathbf{1}^2$: 208; Man. R. M. 169].

Wet meadows, at an altitude of 2000–2500 m.

MONTANA: Park Co., 1887, *Tweedy, 369a;* 1887, *377;* Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 5103;* Sheridan, 1892, *Mrs. L. A. Fitch;* Columbia Falls, 1892, *R. S. Williams, 433;* McDonald's Peak, 1883, *Canby, 183;* Bridger Mts., 1896, *Flodman, 856;* Spanish Peaks, *857;* Spanish Basin, *853.*

YELLOWSTONE PARK: 1884, *Tweedy*, *123*, *124* and *125*; Electric Peak, Aug. 18, 1897, *Rydberg & Bessey*, *5104*.

Erigeron salsuginosus glacialis (Nutt.) Gray, Syn. Fl. 1^2: 209 [Man. R. M. 169]; *Aster glacialis* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 291.

MONTANA: Silver Bow Co., *Mrs. Jennie H. Moore*.

***Erigeron Howellii** Gray, Syn. Fl. 1^2: 209; *Erigeron salsuginosus Howellii* Gray, Proc. Am. Acad. **16**: 93.

Like *E. salsuginosus*, but with larger heads, broader rays, and broader thin leaves, of which the basal ones are spatulate and the upper cauline, ovate and clasping. It grows in mountain meadows, at an altitude of 2500 m.

MONTANA: Upper Marias Pass, 1883, *Canby*, *180*.

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, 1897, *Rydberg & Bessey*, *5101*.

Erigeron macranthus Nutt. Trans. Am. Phil. Soc. (II.) **7**: 310 [Syn. Fl. 1^2: 209; Man. R. M. 169].

In meadows, at an altitude of 1000–2500 m.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy*, *22* and *34*; Lima, 1895, *Rydberg*, *2829*; Gallatin Co., 1886, *Tweedy*, *1142*; Beaver Head Co., 1888, *232*; Indian Creek, July 21, 1897, *Rydberg & Bessey*, *5099*; Great Falls, 1888, *R. S. Williams*, *77*; Belt Mountains, 1883, *Scribner*, *101*; Little Belt Mts., 1896, *Flodman*, *851*; Spanish Basin, *852*.

YELLOWSTONE PARK: 1884, *Tweedy*, *136*.

* **Erigeron speciosus** DC. Prod. **5**: 284 [Syn. Fl. 1^2: 209; Bot. Cal. **1**: 330].

Resembles *E. macranthus* in habit, but the involucre is hirsute-pubescent. It grows in mountain meadows, at an altitude of 2000–2500 m.

MONTANA: Silver Bow Co., *Mrs. Jennie H. Moore*; Forks of the Madison, July 26, 1897, *Rydberg & Bessey*, *5100*; Helena, 1892, *F. D. Kelsey*; Big Blackfoot, 1883, *Canby*, *185*; Little Belt Mts., 1896, *Flodman*, *849*; Spanish Basin, *850*; Bitter Root Valley, 1880, *Watson*.

* Erigeron conspicuus.

Stem from a woody base, 3–5 dm. high, strict, hirsute with rather long white hairs, leafy to the top; lower leaves oblanceolate, 5–10 cm. long, more or less hirsute, acute, tapering into a winged petiole, which is, as well as the leaves, ciliate-margined; upper leaves lanceolate, sessile, more or less clasping; heads more or less corymbose, 7–10 mm. high and 1.5–2 cm. in diameter; bracts linear-acuminate, minutely glandular and somewhat hirsute; rays blue, very numerous, rather narrow, about twice as long as the disk; achenes strigose; pappus double, the outer of few short setose-squamellate hairs.

A near relative of *E. speciosus*, *macranthus* and *subtrinervis*. From the first two it differs in the more hairy stem and leaves, and the stricter habit. The involucre is intermediate between the two, and perhaps more like that of *E. subtrinervis*, from which it is distinguished by its narrow leaves which are very rarely 3-nerved.

MONTANA: Jack Creek, July 14, 1897, *Rydberg & Bessey*, *5095*; Indian Creek, July 21, *5096*.

Erigeron asper Nutt. Gen. **2**: 147 [Ill. Fl. **3**: 385]; *Erigeron glabellus* Nutt. *l. c.* [Syn. Fl. **1**^{2}: 209; Man. R. M. 169].

Hillsides, up to an altitude of 2500 m.

MONTANA: Priest's Pass and Upper Flathead River, 1883, *Canby*, *183*; White Sulphur Springs, 1883, *Scribner*, *100*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy*, *126*.

Erigeron pumilus Nutt. Gen. **2**: 147 [Ill. Fl. **3**: 386; Syn. Fl. **1**^{2}: 210; Man. R. M. 170].

On dry plains, up to an altitude of 2500 m.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen*; Upper Missouri, *Geyer*; Trail Creek, 1887, *Tweedy*, *362*; Madison Co., *Mrs. Flora McNulty*; Great Falls, 1891, *R. S. Williams*, *344*; Custer Co., 1892, *Mrs. Light*; Madison River, 1883, *Scribner*, *101a*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall*.

Erigeron concinnus Torr. & Gray, Fl. N. Am. **2**: 174 [Syn. Fl. **1**^{2}: 210; Bot. Cal. **1**: 330; Man. R. M. 170].

On dry hills and plains, at an altitude of 1500–2500 m.

MONTANA: Trail Creek, 1887, *Tweedy*, *362*; Bozeman, 1887, *361*; Philipsburg, 1892, *F. D. Kelsey*.

Erigeron trifidus Hook. Fl. Bor. Am. **2**: 17; *Erigeron compositus trifidus* Gray, Proc. Am. Acad. **16**: 90 [Syn. Fl. **2**^{1}: 211; Man. R. M. 170].

Dry mountain ranges, at an altitude of about 2000 m.

MONTANA: Woodruff's Falls, Upper Marias Pass, 1883, *Canby*, *178*.

Erigeron multifidus; *Erigeron compositus* Hook. Fl. Bor. Am. **2**: 17. 1834 [Syn. Fl. 1^2: 211, mainly: Man. R. M. 170]; not Pursh, 1814.

This is the common form of the Rocky Mountains known as *E. compositus*, but differs considerably from Pursh's plant. In the latter the leaves are about 5 cm. long, thrice divided into linear lobes, and only hirsute on the petioles, while in *E. multifidus* they are mostly twice ternate, with short oblong or spatulate lobes and are generally hirsute all over. *E. compositus* has larger heads, over 1 cm. high and often 1.5 cm. in diameter, with subequal and appressed bracts, while in *E. multifidus* the heads are 6–8 mm. high and about 1 cm. in diameter and the outer bracts shorter and often spreading in age. Of *E. compositus* there is only one specimen in the Columbia University collection and one in that of the New York Botanical Garden. The former was collected at Pursh's type locality, near Lewiston, Idaho, by Heller, 1896, *3014;* the other by A. Nelson in Wyoming.

On high dry ridges, at an altitude of 1500–3000 m.

MONTANA: Flathead River, *Wyeth;* Hell Gate, *John Pearsall, 826* and *857:* Beaver Head Co., 1888, *Tweedy, 234;* Deer Lodge, 1888, *F. W. Traphagen;* Silver Bow Co., *Mrs. Jennie H. Moore:* Mill Creek, 1887, *Tweedy, 374;* Bridger Mts., June 15, 1897, *Rydberg & Bessey, 5089:* Spanish Basin, June 26, *5090:* Crooked Falls, 1888, *R. S. Williams, 222;* Head of Stillwater, 1897, *P. Koch, 73;* Shields River, 1883, *Scribner, 101c;* Bozeman, *101b.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* 1885, *Tweedy, 708* and *709;* Hoodoo Peak, 1897, *P. Koch, 8.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5088.*

Erigeron multifidus discoideus (Gray): *Erigeron compositus discoideus* Gray, Am. Journ. Sci. (II.) **33**: 237 [Syn. Fl. 1^2: 211; Man. R. M. 170].

On dry ridges, at an altitude of 2000–3000 m.

MONTANA: Gallatin Co., 1888, *Tweedy, 235;* Cedar Mts., July 16, 1897, *Rydberg & Bessey, 5091.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall:* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 5092.*

* **Erigeron multifidus nudus**; *Erigeron compositus glabratus* Macoun, Cat. Can. Pl. 231, 1884; not *E. glabratus* Hook. 1834.

Resembles the species, but is not hirsute, except a few hairs on the petioles and the bracts, nor glandular-puberulent, except slightly so on the upper part of the stem and the involucre. At an altitude of nearly 3000 m.

MONTANA: Cedar Mt., July 16, 1897, *Rydberg & Bessey, 5093.*

Erigeron ursinus Eaton. King's Exped. **5**: 148 [Syn. Fl. **1**²: 211; Bot. Cal. **1**: 327; Man. R. M. 171].

On high mountains, at an altitude of nearly 3000 m.

MONTANA: Park Co., 1887, *Tweedy, 369;* Yogo, 1888, *R. S. Williams, 782.*

YELLOWSTONE PARK: Mt. Washburn, 1885, *Tweedy, 704;* 1884, *121; C. C. Parry, 135.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5102.*

Erigeron radicatus Hook. Fl. Bor. Am. **2**: 17 [Syn. Fl. **1**²: 211; Man. R. M. 171].

On top of the highest mountains, at an altitude of nearly 3000 m.

MONTANA: Park Co., 1887, *Tweedy, 367;* Gallatin Co., 1886, *1140:* Spanish Basin, June 26, 1897, *Rydberg & Bessey, 5084:* Indian Creek, July 22, *5086;* Old Hollowtop, Pony, July 9, 1897, *5087;* Head of Stillwater, 1897, *P. Koch, 66;* Spanish Peaks, 1896, *Flodman, 846.*

YELLOWSTONE PARK: Mt. Holmes, 1884, *Tweedy, 121;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 5085.*

* **Erigeron asperugineus** Gray, Proc. Am. Acad. **16**: 91 [Syn. Fl. **1**²: 212].

Like *E. tener*, but with larger heads, and broadly ovate or oval slender-petioled basal leaves. It grows on high hills, at an altitude of 2000 m.

MONTANA: Melrose, 1895, *Rydberg, 2823.*

* **Erigeron Tweedyii** Canby, Bot. Gaz. **13**: 17.

A near relative of *E. asperugineus* and *E. tener*, but it has much broader leaves than the latter, and a finer pubescence and broader bracts than the former. On alpine peaks, at an altitude of about 3000 m.

MONTANA: Cinnabar, 1887, *Tweedy;* Beaver Head Co., 1888, *17;* Trail Creek, 1887, *360* (type).

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5082.*

* Erigeron gracilis.

Perennial, with a branched rootstock; stem simple, ascending at the base, slender, strigose, about 1.5 dm. high, monocephalous; basal leaves spatulate to linear-oblanceolate, thin, slightly strigose, entire, 2–4 cm. long; stem leaves narrowly linear, acuminate, the upper reduced; head about 6 mm. high, 10–12 mm. in diameter; bracts narrowly linear, tinged with purple, strigose, only slightly imbricated; rays about 50, slender, light purplish, 7–10 mm. long.

This has been labeled *E. ochroleucus*, but is easily distinguished by the slender branched rootstock, slender simple stems, thin leaves and longer purplish rays. It grows in low meadows, at an altitude of about 2500 m.

Yellowstone Park: Slough Creek, 1885, *Tweedy, 702* (type); Yancy's 1899, *Aven Nelson, 5723.*

* **Erigeron argentatus** Gray, Proc. Am. Acad. **8**: 649 [Syn. Fl. **1**^{2}: 212].

Somewhat like *E. canus*, but taller, with larger heads and finer white pubescence. Dry hills, at an altitude of 2000 m.

Montana: Jack Creek, July 19, 1897, *Rydberg & Bessey, 5083*; Lima, 1895, *Rydberg, 2827.*

* **Erigeron peucephyllus** Gray, Proc. Am. Acad. **16**: 89 [Syn. Fl. **1**^{2}: 213].

Somewhat like *E. ochroleucus* but with unequal imbricated bracts, more lax leaves, and cinereous, not hirsute pubescence. On rocky hills and meadows, at an altitude of 2000–2500 m.

Montana: Bear Gulch, 1887, *Tweedy, 363.*

Erigeron Eatonii Gray, Proc. Am. Acad. **16**: 91 [Syn. Fl. **1**^{2}: 214; Man. R. M. 172].

On high mountain tops, at an altitude of 2500–3000 m.

Montana and Idaho: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5077.*

* **Erigeron Parryi** Canby & Rose, Bot. Gaz. **15**: 65.

Like *E. radicatus* in habit, but with hirsute leaves, a double pappus, and a head more resembling a depauperate *E. caespitosus.* Grows in dry soil.

Montana: Grasshopper Creek, 1888, *Tweedy, 15.*

Erigeron caespitosus Nutt. Trans. Am. Phil. Soc. (II.) **7**: 307 [Ill. Fl. **3**: 386; Syn. Fl. **1**^{2}: 214; Bot. Cal. **1**: 327; Man. R. M. 172].

On dry hills, at an altitude of 1500–2500 m.

MONTANA: *Nuttall;* Gallatin Co., 1887, *Tweedy, 373* and *375;* East Boulder, 1887, *370;* Beaver Head Co., 1888, *233;* Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 5079;* Great Falls, 1891, *R. S. Williams;* Bozeman, 1887, *Tweedy, 373;* Great Falls, 1885, *F. W. Anderson, 219;* Mt. Helena, 1883, *Canby, 181;* Fort Logan, 1882, *Canby;* Bozeman, 1895, *Rydberg, 2826;* Cottonwood Creek, 1896, *Flodman, 844;* Elk Mts., *845.*

YELLOWSTONE PARK: 1887, *Dr. Chas. H. Hall;* Mammoth Hot Springs, 1884, *Tweedy, 128.*

IDAHO: Mt. Chauvet, July 21, 1897, *Rydberg & Bessey, 5078.*

* **Erigeron subcanescens** Rydb. Bull. Torr. Bot. Club, **24**: 294; *Diplopappus canescens* Hook. Fl. Bor. Am. **2**: 21; *Erigeron canescens* Torr. and Gray, Fl. N. Am. **2**: 179; not Willd.

Like *E. caespitosus*, but taller, 2–3 dm. high, with thinner pubescence, narrower bracts and leaves, and smaller heads.

MONTANA: Spanish Basin, 1896, *Flodman, 836.*

Erigeron corymbosus Nutt. Trans. Am. Phil. Soc. (II.) **7**: 308 [Syn. Fl. **1**^{2}: 214; Bot. Cal. **1**: 329; Man. R. M. 172].

On dry hills and plains, at an altitude of 1000–2500 m.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy, 1;* Bozeman, 1887, *Tweedy, 366;* Grizzly Creek, *364;* Pony, July 6, 1897, *Rydberg & Bessey, 5080;* Jack Creek, July 15, *5081;* Trout Creek, 1891, *R. S. Williams;* Centerville, 1883, *Scribner, 101d;* Lima, 1895, *Rydberg, 2821.*

YELLOWSTONE PARK: Specimen Ridge, 1885, *Tweedy, 705.*

* **Erigeron Scribneri** Canby, Bot. Gaz. **15**: 150.

In habit it most resembles *E. Parryi*, but is not at all hirsute, and the involucral bracts are different and more imbricated. The characters of the head, although much smaller, indicate a close relationship with *E. Montanensis*, from which it is easily distinguished by the smaller size and the habit.

MONTANA: Little Belt Mountain, 1883, *Scribner, 77*, in part.

* **Erigeron Montanensis** Rydb. Bull. Torr. Bot. Club, **24**: 296; *Erigeron Tweedyana* Canby & Rose, Bot. Gaz. **15**: 65; not *E. Tweedyi* Canby, Bot. Gaz. **13**: 17.

Professor Aven Nelson suggests that this species should perhaps be included in his new genus *Wyomingia*. If so, some of the other species, as, for instance, *E. Parryi*, *E. caespitosus*, *E. corymbosus*, *E. tener*, *E. esperifolius*, and *E. canus*, might have to be included also, as they have broad rays, the same habit and the bracts approach those of *Wyomingia*. If any of these species are to be included, the generic description must be modified. I, therefore, retain this species as well as the rest in *Erigeron* until, after further study, it may be possible to better limit his genus. *E. Montanensis* is characterized by its broad white (or straw-colored) rays, white-woolly 3–4 serial bracts, and linear leaves. It grows on dry hills, at an altitude of 2000–2500 m.

MONTANA: Bridger Mountains, June 12, 1897, *Rydberg & Bessey, 5072;* Great Falls, 1886, *R. S. Williams, 345;* Elk Mountains, 1896, *Flodman, 837;* Little Belt Pass, *838;* Little Belt Mountains, 1883, *Scribner, 77;* Park Co., 1888, *Tweedy;* Billings, 1882, *Canby.*

Erigeron decumbens Nutt. Trans. Am. Phil. Soc. (II.) **7**: 309 [Syn. Fl. 1^2: 215; Man. R. M. 173].

MONTANA: According to Gray.

Erigeron Philadelphicus L. Sp. Pl. 863 [Ill. Fl. **3**: 388; Syn. Fl. 1^2: 217; Bot. Cal. **1**: 331; Man. R. M. 172].

In wet meadows, perhaps reaching an altitude of 1000 m.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy, 2* and *4;* 1892, *R. S. Williams, 934.*

* **Erigeron oblanceolatus** Rydb. Bull. Torr. Bot. Club, **24**: 294.

May be nearest related to *E. Philadelphicus*, but it has narrowed oblanceolate acute leaves, with a few sharp teeth. The heads are fewer and larger, resembling those of *E. speciosus*. It grows in wet meadows, at an altitude of 1000–2500 m.

MONTANA: Helena, 1889, *F. D. Kelsey;* Beaver Head Co., 1888, *Tweedy 16* (depauperate); Silver Bow Co., *Mrs. Jennie H. Moore;* Spanish Basin, July 24 and 28, 1897, *Rydberg & Bessey, 5097* and *5098* (depauperate); Great Falls, 1891, *R. S. Williams, 704.*

Erigeron divergens Torr. & Gray, Fl. N. Am. **2**: 175 [Ill. Fl. **3**: 388; Syn. Fl. 1^2: 218; Bot. Cal. **1**: 331; Man. R. M. 173].

In meadows, at an altitude of 1500–2500 m.

MONTANA: Park Co., 1887, *F. Tweedy, 372.*

YELLOWSTONE PARK: Upper Geyser Basin, Aug., 1897, *Rydberg & Bessey, 5076.*

Erigeron Beyrichii (F. & M.) Torr. & Gray, Fl. N. Am. 2: 176 as synonym; *Stenactis Beyrichii* F. & M. Ind. Sem. Hort. Petrop. 1838: 5; *Erigeron ramosus Beyrichii* Smith & Pound, Bot. Surv. Neb. 2: 11 [Ill. Fl. 3: 389]; *Erigeron strigosus Beyrichii* Torr. & Gray, Fl. N. Am. 2: 175 [Syn. Fl. 1²: 219; Man. R. M. 174].

In the dryer valleys and on prairies, up to an altitude of 2500 m.

MONTANA: Park Co., 1887, *Tweedy, 371;* East Boulder, 1887, *571;* Sand Coulee, 1885, *R. S. Williams, 263.*

Erigeron acris L. Sp. Pl. 863 [Ill. Fl. 3: 390; Syn. Fl. 1²: 219; Bot. Cal. 1: 327; Man. R. M. 174].

In the mountains, at an altitude of 1500–2500 m.

MONTANA: Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 5073;* Neihart, 1888, *R. S. Williams, 207*, in part; Priest's Pass, 1891, *F. D. Kelsey;* Bridger Mts., 1896, *Flodman, 841;* Spanish Basin, *842.*

YELLOWSTONE PARK: Black Tail Deer Creek, 1884, *Tweedy, 130.*

Erigeron minor (Hook.) Rydb. Bull. Torr. Bot. Club, 24: 295; *Erigeron glabratus minor* Hook. Fl. Bor. Am. 2: 18; *E. armeriaefolius* Gray, Proc. Am. Acad. 8: 648, in part [Syn. Fl. 1²: 220; Bot. Cal. 1: 326; Man. R. M. 174]; not Turcz.

Gray included in *E. armerioides* two distinct forms, this species and the next. *E. minor* is low, 2–3 dm. high; basal leaves numerous and spatulate; stem-leaves without petiole; inflorescence racemose. It grows in mountain meadows, at an altitude of 1500–2500 m.

MONTANA: Neihart, 1888, *R. S. Williams, 207*, in part; Melrose, 1895, *Rydberg, 2824;* Elk Mts., near Black Hawk, 1896, *Flodman, 839.*

YELLOWSTONE PARK: Indian Creek, 1884, *Tweedy, 129.*

Erigeron lonchophyllus Hook. Fl. Bor. Am. 2: 18; *Erigeron armeriaefolius* Gray, l. c., in part [Bot. Cal. 1: 327; Man. R. M. 174, in part]; not Turcz.

Tall, 3–6 dm. high; basal leaves few, oblanceolate; lower stem-leaves petioled; inflorescence open with long pedicels. At an altitude of about 1500 m.

MONTANA: Melrose, 1895, *Rydberg, 2825;* East Gallatin Swamps, 1896, *Flodman, 840.*

Erigeron debilis (Gray); *Erigeron acris debilis* Gray, Syn. Fl. **1**^{2}: 220 [Man. R. M. 174].

Evidently perfectly distinct from the European *E. acris* L. It grows among rockslides, at an altitude of 2000–3000 m.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey, 5074:* Electric Peak, Aug. 18, *5075;* Madison Valley, 1872, *J. M. Coulter;* McDonald's Peak, 1883, *Canby, 186;* Upper Marias Pass, *179;* Long Baldy, Little Belt Mountains, 1896, *Flodman, 843.*

Leptilon Canadensis (L.) Britton, Ill. Fl. **3**: 391; *Erigeron Canadensis* L. Sp. Pl. 863 [Syn. Fl. **1**^{2}: 221; Bot. Cal. **1**: 331; Man. R. M. 174].

In waste places, up to an altitude of 1500 m.

MONTANA: Great Falls, 1886, *R. S. Williams, 425;* Fridley, Aug. 22, 1897, *Rydberg & Bessey, 5071;* Smith River, 1883, *Scribner, 98;* Bitter Root Valley, 1888, *Watson.*

Filago prolifera (Nutt.) Britton, Mem. Torr. Bot. Club, **5**: 329 [Ill. Fl. **3**: 395]; *Evax prolifera* Nutt.: DC. Prod. **5**: 459 [Syn. Fl. **1**^{2}: 229; Man. R. M. 175].

Dry barren hills, at an altitude of 1000 m.

MONTANA: Lower Sand Coulee, 1891, *R. S. Williams, 784.*

Antennaria dimorpha (Nutt.) Torr. & Gray, Fl. N. Am. **2**: 431 [Ill. Fl. **3**: 400: Syn. Fl. **1**^{2}: 231; Bot. Cal. **1**: 339; Man. R. M. 176]; *Gnaphalium dimorphum* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 405.

Dry hills, up to an altitude of 2500 m.

MONTANA: Hell Gate, *John Pearsall, 836;* Gallatin Co., 1888, *Tweedy, 219;* Helena, 1886, *R. S. Williams, 352;* Livingston, 1883, *Scribner, 101.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 172.*

* **Antennaria flagellaris** Gray, Proc. Am. Acad. **17**: 212 [Syn. Fl. **1**^{2}: 231]: *Antennaria dimorpha flagellaris* Torr. & Gray, U. S. Exped. **17**: 366.

Belongs to the same group as *A. dimorpha*, but has smaller heads, narrower leaves, and flagelliform stolons. At an altitude of about 2800 m.

YELLOWSTONE PARK: Mt. Norris, 1885, *Tweedy, 729.*

Antennaria luzuloides Torr. & Gray, Fl. N. Am. **2**: 430 [Syn. Fl. 1^2: 232; Bot. Cal. 1: 340; Man. R. M. 176].

On hillsides, at an altitude of about 2000 m.

MONTANA: Clark's Fork, 1882, *Tweedy, 411;* Bridger Mountains, 1896, *Flodman, 869.*

* Antennaria oblanceolata.

Stems simple, from a branching caudex, not surculose-proliferous, 2, seldom 3, dm. high, slender; basal leaves broadly oblanceolate or spatulate, white silky-tomentose, mucronate, evidently 3-nerved, 3–5 cm. long; stem-leaves similar, but slightly narrower, the uppermost reduced and linear-lanceolate; heads in a small corymb, small, 4–5 mm. high; involucre turbinate-campanulate, tomentose only at the base, its bracts otherwise glabrous, brownish, only the inner ones with a white tip, which in both kinds is oblong, in the sterile obtuse, in the fertile acutish; sterile pappus much dilated at the end.

Intermediate between *A. luzuloides* and *A. argentea*, resembling the former most in the size of the plant as well as of the heads, in the form of the involucre, and the pubescence and color of the bracts; and the latter in the form of the leaves. The tomentum is finer and more appressed than in either. It grows on hillsides.

MONTANA: Bridger Mountains, June 18 and 11, 1897, *Rydberg & Bessey, 5168* (type) and *5169.*

OREGON: Siskiyou Mountains, 1887, *Howell; J. S. Newberry.*

CALIFORNIA; Mt. Shasta, 1897, *H. E. Brown, 355.*

* Antennaria anaphaloides.

Antennaria Carpatica pulcherrima Wats. King's Exped. **5**: 185; not Hook.

Stems simple, not surculose, about 4 dm. high, stout; basal leaves narrowly oblanceolate, 10–15 cm. long, acute, more or less distinctly 3-nerved, loosely tomentose; stem-leaves linear, acuminate, the upper ones small; corymb many-flowered and usually rather open, heads 6–8 mm. high, almost hemispheric, tomentose at the base, its bracts in 3–4 series, brown below, and in both sexes with oblong papery tips, which in the sterile head are obtuse or truncate, in the fertile obtuse or acutish; sterile pappus moderately dilated above.

It has hitherto been confused with *A. pulcherrima*, and is much more common than that species in the United States and has much narrower leaves. The pistillate heads of *A. pulcherrima* are often 1 cm. high, more turbinate, with ovate to lanceolate brownish bracts, which are almost always without white papery tips. The tips of the staminate heads of *A. pulcherrima* are much shorter and more rounded. The heads of *A. anaphaloides* resemble, therefore, more those of *A. argentea*, while the habit is that of *A. pulcherrima*.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey*, *5170* (type); Bridger Mountain, June 14, *5171*; Park Co., 1887, *Tweedy*, *318*: Beaver Head Co., 1888, *216*: Elk Mountains, 1896, *Flodman*, *868*: Lima, 1895, *Rydberg*, *2934*; Silver Bow Co., *Mrs. Jennie Moore*; Warm Springs, Helena, 1892, *Kelsey*; Jefferson City, 1883, *Scribner*, *101c*; Blackfoot River, 1883, *Canby*, *188*.

Antennaria pulcherrima (Hook.) Greene, Pittonia, **3**: 176; *Antennaria Carpatica pulcherrima* Hook. Fl. Bor. Am. **1**: 329 [Syn. Fl. **1**^{2}: 232; Bot. Cal. **1**: 340; Man. R. M. 176].

Hillsides, at an altitude of 1500–2500 m.

MONTANA: North Sun River, 1887, *R. S. Williams*, *202*.

YELLOWSTONE PARK: 1884, *Tweedy*, *175*.

* **Antennaria lanata** (Hook.) Greene, Pittonia, **3**: 288: *Antennaria Carpatica lanata* Hook. Fl. Bor. Am. **1**: 329.

Resembles the European *A. Carpatica*, but with the broader leaves densely lanate on both sides, while in that species the leaves are glabrate above. *A. lanata* differs from *A. pulcherrima* in the lower habit, seldom over 15 cm. high, the dense corymb, and the dark tips of the bracts of the fertile heads.

MONTANA: Park Co., 1887, *Tweedy*, *357*.

Antennaria media Greene, Pittonia, **3**: 286; *Antennaria alpina* Hook. Fl. Bor. Am. **1**: 329 [Syn. Fl. **1**^{2}: 232, mainly; Bot. Cal. **1**: 339; Man. R. M. 176]; not L.

Differs from the European *A. alpina* L. in the spatulate leaves, which are conspicuously tomentose on both sides. It grows on alpine peaks, at an altitude of 2500–3000 m.

MONTANA: Indian Creek, July 22, *Rydberg & Bessey*, *5167*; Bozeman Pass, 1883, *Tweedy* †: Long Baldy and Yogo Baldy, Little Elk Mts., 1896, *Flodman*, *862* and *864*: Tiger Butte, 1887, *R. S. Williams*, *729*; Lake Plateau, 1897, *P. Koch*, *97*.

YELLOWSTONE PARK: Electric Peak, Aug. 18, 1897, *Rydberg & Bessey*, *5166*; 1884, *Tweedy*, *174*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *5165*.

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† These specimens have leaves that are cuneate-spatulate and in age glabrous, and may represent a distinct species, but the material is too incomplete for a good description.

* **Antennaria umbrinella** Rydb. Bull. Torr. Bot. Club, **24**: 302.

Differs from the preceding in the oblong obtuse umber to isabel-colored bracts of the fertile heads. It grows on the tops of the higher mountains, at an altitude of 2500–3000 m.

MONTANA: Bridger Mts., June 18, 1897, *Rydberg & Bessey, 5162;* Old Hollowtop, Pony, July 9, *5163;* Long Baldy, Little Belt Mts., 1896, *Flodman, 859;* Spanish Peaks, *860.*

YELLOWSTONE PARK: 1885, *Tweedy, 726.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5164.*

* Antennaria flavescens.

Surculose-proliferous, almost cespitose: leaves of the stolons broadly spatulate, about 1 cm. long, acute, very densely tomentose on both sides with rather appressed fine yellowish tomentum; flowering stems about 1 dm. high, very slender: stem-leaves oblong to linear, small, erect; heads about half a dozen in a small subcapitate cluster, 4–5 mm. high and 5 mm. in diameter: involucre campanulate, densely tomentose at the base, its bracts in about 3 series, the papery portion isabel-color, in the sterile head rotund or broadly elliptic, in the fertile narrowly oblong, the outer obtuse, the inner acute; staminate pappus pure white with very broad tips, the pistillate duller, filiform.

Nearest related to *A. reflexa* A. Nelson, but differs in the lighter colored bracts which are much smaller, as is best shown in the staminate plant. It is also closely related to *A. umbrinella*, but has larger basal leaves and smaller stem leaves, much lighter colored involucral bracts, which in the pistillate plant are narrower and more acute, and a more appressed, glossier, yellowish tomentum. From *A. microphylla* it differs in the lower habit, the color of the tomentum and of the bracts, and the subcapitate inflorescence. It grows on very dry hillsides, at an altitude of about 2000 m.

MONTANA: Bridger Mountains, June 11, 1897, *Rydberg & Bessey, 5145* (type); Spanish Basin, June 26, *5146;* June 23, *5155.* The last number is represented by somewhat taller specimens, with more open inflorescence, longer heads and loosely floccose stem; they approach *A. microphylla.*

IDAHO: Beaver Cañon, 1895, *Rydberg, 2869.*

YELLOWSTONE PARK: Indian Creek, 1884, *Tweedy, 173* in part.

* **Antennaria parvifolia** Nutt. Trans. Am. Phil. Soc. (II.) **7**: 406 [Rydb. Bull. Torr. Bot. Club, **24**: 301]; *Antennaria dioica*

rosea D. C. Eaton, King's Exped. **5**: 185 (name only); *A. rosea* Greene, Pittonia, **3**: 281.

Professor Greene claims that Nuttall's *A. parvifolia* is the same as my *A. microphylla*. I have seen Nuttall's type in the Philadelphia Academy, and it is the same as *A. dioica rosea* Eaton. Professor Greene's reduction of my *A. microphylla* was unwarranted and his arguments are without foundation. Nuttall's description of the staminate plant is also correct and does not apply to my *A. microphylla*. While the bracts of the pistillate plant are generally strongly tinged with red, this is not the case in the very rare staminate plant. In the Columbia collections there is not a single specimen of the latter and the other larger herbaria may be just as deficient. Good specimens are represented by our number *5159*: these have yellowish-white bracts.

Grows in meadows and open woods, at an altitude of 2000–2500 m.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey*, *5157*, *5158* (white bracts), *5159* (male): Bridger Mts., June 18, *5160*; Deer Lodge, *Miss Hobson*: Lewis and Clarke Co., 1891, *F. D. Kelsey*.

YELLOWSTONE PARK: East De Lacy's Creek, Aug. 10, *Rydberg & Bessey*, *5161*; Gardiner, 1885, *Tweedy*, *728*.

* **Antennaria imbricata** E. Nelson, Bot. Gaz. **27**: 211.

Very closely related to the preceding, and perhaps a form of it, but differs in the broader spatulate leaves and slightly larger heads, with more imbricated bracts.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey*, *5157a*.

* **Antennaria microphylla** Rydb. Bull. Torr. Bot. Club, **24**: 303.

Characterized by the very small spatulate white leaves, and the small heads with slightly greenish-tinged bracts. It grows on dry hillsides, at an altitude of 1500–2500 m.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey*, *5154*; Gallatin Co., *Mrs. Hodgman*; Manhattan, 1895, *Rydberg*, *2831*; Bozeman, 1896, *Flodman*, *864*.

YELLOWSTONE PARK: 1893, *Addison Brown*; 1884, *Tweedy*, *173*; Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey*, *5156* (depauperate, 5 cm. high); Indian Creek, 1884, *Tweedy*, *173*, in part.

* **Antennaria corymbosa** E. Nelson, Bot. Gaz. **27**: 212.

Resembles *A. parvifolia* somewhat in the form of the leaves, but they are still narrower and have an altogether different pubescence, being finely silky. It differs also in the more slender stem, the smaller heads, and the coloration of the bracts, which are very tomentose at the base, dark brown in the middle, and the upper portion papery white, in the staminate head broadly elliptic and obtuse, in the pistillate oblong, obtuse or acutish. The pappus of the staminate flowers is white, broadly club-shaped at the end, that of the pistillate dirty white, filiform. The sterile plant was unknown to Mr. Nelson when his description was drawn, but excellent material is found in our collection. It may also be nearly related to *A. pedicellata* Greene, which I have not seen; that species, however, is described as having ample spreading stem-leaves, and no reference is made to the coloration of the bracts, which in this species is very striking. It grows in low rather wet meadows, in large patches 2 or 3 m. in diameter, at an altitude of about 2000 m.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey*, *5141*; Old Hollowtop, Pony Mts., July 7, *5142*.

YELLOWSTONE PARK: East DeLacy's Creek, August 10, 1897, *Rydberg & Bessey*, *5143*.

* Antennaria bracteosa.

Freely surculose-proliferous: leaves of the stolons broadly spatulate, petioled, about 2 cm. long, acutish or mucronate, white-tomentose on both sides, but especially on the lower; stem-leaves larger, about 3 cm. long, oblong or narrowly oblong-oblanceolate, with a broad base, mostly acute; flowering stem 3–4 dm. high, strict; heads rather densely corymbose, 7–8 mm. long, and 5–6 mm. in diameter; involucre campanulate, its bracts greenish and tomentose below, papery white above, in the fertile head oblong or lanceolate, acute or in the inner even acuminate, considerably exceeding the disk; sterile head unknown.

Nearest related to *A. foliacea*, which it resembles in habit and leaves, but differs in having a much denser inflorescence and very long bracts.

MONTANA: Jack Creek, July 15, 1897, *Rydberg & Bessey*, *5144*.

* **Antennaria foliacea** Greene, Pittonia, **3**: 279; *Antennaria pedicellata* Rydb. Bull. Torr. Bot. Club, **24**: 303; not Greene.

Characterized by the ample cauline leaves, much larger than those of the stolons; head slender-pedicelled, its bracts in several series, white-tipped, the outer obtuse, the inner acute. It grows in dry valleys, at an altitude of about 2000 m.

MONTANA: Little Belt Mountains, 1896, *Flodman, 867;* Jack Creek, July 14, 1897, *Rydberg & Bessey, 5147;* Spanish Basin, June 28, *5148.*

* Antennaria foliacea humilis.

Like *A. foliacea* in every respect, except that the stem is much lower, only 1.5–2 dm. high, and the leaves much smaller, both basal and stem leaves being about 1.5 cm. long, the latter not being much enlarged as in the typical *A. foliacea.*

It grows on rather dry hillsides.

MONTANA: Bridger Mountains, June 14, 1897, *Rydberg & Bessey, 5149* (type); Spanish Basin, June 28, *5150;* Silver Bow Co., *Mrs. Jennie Moore.*

Antennaria aprica Greene, Pittonia, **3**: 282; *Antennaria dioica* Gray, Syn. Fl. **1**^{2}: 233, in part [Man. R. M. 176].

A low plant, less than 1 dm. high, with large heads. It grows on dry hills, at an altitude of 1000–2000 m.

MONTANA: 1888, Deer Lodge, *F. W. Traphagen;* Bridger Mts., June, 1897, *Rydberg & Bessey, 5151;* Spanish Basin, June 28, *5153;* Cinnabar, 1885, *Tweedy, 726;* Deer Lodge, 1892, *W. T. Shaw;* Gallatin Co., *Hodgman;* Prickly Pear Cañon, 1886, *R. S. Williams, 203a* (rose-colored bracts); Gallatin City, 1883, *Scribner, 101g* and *h* (♂ and ♀).

YELLOWSTONE PARK: 1885, *Tweedy, 727.*

Antennaria racemosa Hook. Fl. Bor. Am. **1**: 330 [Syn. Fl. **1**^{2}: 233: Man. R. M. 177].

On wooded hillsides, at an altitude of 2000–2500 m.

MONTANA: 1889, Deer Lodge, *F. W. Traphagen;* Ellison, 1890, *F. D. Kelsey;* Trail Creek, 1887, *Tweedy, 319;* Jack Creek, July 14, 1897, *Rydberg & Bessey, 5139;* Spanish Basin, June 28, *5140;* Belt Mts., 1886, *F. W. Anderson, 226;* Gallatin Co., *Mrs. Mary Alderson;* Spanish Basin, 1896, *Flodman, 866;* Little Belt Mts., *865;* Melrose, 1895, *Rydberg, 2932;* Bozeman, *2933;* Granite, 1892, *F. D. Kelsey;* 1882, *Tweedy, 412;* Madison Valley, 1871, *Hayden Survey;* 1872, *Coulter;* Jefferson City, 1883, *Scribner, 101d;* Belt Mts., 1883, *Canby;* Odell's, 1880, *Watson.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 177.*

Anaphalis subalpina (Gray): *Anaphalis margaritacea subalpina* Gray, Syn. Fl. 1²: 233; *A. margaritacea* Coulter, Man. R. M. 177; not L.

The Rocky Mountain plant differs from the European and Eastern American species in having a more contracted corymb, and broader and more lanose leaves. It grows at an altitude of 1500–2500 m.

MONTANA: Boulder River, 1887, *Tweedy, 316;* Gallatin Co., *Mrs. Findlay;* Tiger Butte, 1886, *R. S. Williams, 428;* Lewis and Clarke Co., 1891, *F. D. Kelsey;* Little Belt Mts., 1896, *Flodman, 858;* Bitter Root Valley, 1880, *Watson.*

YELLOWSTONE PARK: Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 5137;* Upper Basin, Aug. 8, *5138;* 1884, *Tweedy, 176.*

Gnaphalium palustre Nutt. Trans. Am. Phil. Soc. (II.) **7**: 403 [Syn. Fl. 1²: 235; Bot. Cal. **1**: 342].

In sandy soil, up to an altitude of 2500 m.

MONTANA: Great Falls, 1891, *R. S. Williams, 53;* Melrose, 1895, *Rydberg, 2830;* Billings, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: Upper Geyser Basin, Aug. 8, 1897, *Rydberg & Bessey, 5136.*

* Gnaphalium sulphurescens.

Gnaphalium luteo-album Hook. Fl. Bor. Am. **1**: 328, 1833; not L. 1753; *Gnaphalium Sprengelii* Gray, Syn. Fl. 1²: 234, in part, 1886 [Man. R. M. 178, in part (?)]; not Hook. & Arn., 1841.

Stem simple, from an annual root, 3–4 dm. high, woolly, often slightly yellowish; leaves linear, or the lower oblong-spatulate, white-woolly with rather appressed pubescence, mostly erect and close to the stem; heads in a small glomerate cyme, about 5 mm. high and 4 mm. in diameter; involucre woolly at the base, otherwise glabrous, shining and yellowish; achenes oblong, obtusely angled, glabrous; pappus straw-colored, falling off separately.

Differs from *G. Chilense* Spreng. (*G. Sprengelii* Hook. & Arn.) in the simple stem, smaller size, small and dense flower-cluster, and yellowish involucre. It resembles *G. luteo-album* of Europe, which differs in the scabrous achenes.

YELLOWSTONE PARK: Lower Geyser Basin, August 4, 1897, *Rydberg & Bessey, 5135;* Hot Springs, 1884, *Tweedy, 172;* Mud Springs, 1871, *Hayden Survey.*

*Gnaphalium lagopodioides.

Stems several, from an apparently biennial root, about 1 dm. high, densely woolly, simple up to the inflorescence; leaves oblong-spatulate, 1–2 cm. long, densely covered with white rather loose wool; heads in small conglomerate cymes, about 5 mm. high and 4 mm. in diameter; involucre woolly at the base, glabrous, shining, more or less yellowish above; bracts oblong, acutish, somewhat erose at the end; achenes oblong, obtusely angled, smooth: pappus straw-colored, its bristles falling off separately.

Nearest related to the preceding species, and perhaps only a form of it, but differs in the lower habit, the branching at the base into several stems, the stronger apparently biennial root, the shorter leaves, and the looser pubescence. It grows in the loose geyser formations of the Yellowstone Park.

YELLOWSTONE PARK: Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 5134.*

***Adenocaulon bicolor** Hook. Bot. Misc. 1: 19 [Syn. Fl. 1^2: 237].

A plant 4–5 dm. high, with triangular-cordate sinuately dentate leaves, white-floccose beneath and with winged petioles, and glandular-pubescent panicle of small discoid heads with ovate bracts in one series. Grows in damp woods west of the mountains.

MONTANA: Columbia Falls, *Mrs. Kennedy, 29.*

Rudbeckia hirta L. Sp. Pl. 907 [Ill. Fl. 3: 416: Syn. Fl. 1^2: 260; Man. R. M. 183].

Probably found in the eastern part of the State, as it is common in neighboring Wyoming and South Dakota, but I have seen no specimen.

Rudbeckia laciniata L. Sp. Pl. 2: 906 [Ill. Fl. 3: 906: Syn. Fl. 1^2: 262; Man. R. M. 183].

On rich moist ground, at an altitude of 1000–2000 m.

MONTANA: Bozeman, 1884, *Tweedy, 151;* Helena, 1892, *F. D. Kelsey;* Bozeman Cañon, 1892, *W. T. Shaw;* Lewis and Clarke Co., *Mrs. Muth.*

Rudbeckia occidentalis Nutt. Trans. Am. Phil. Soc. (II.) 7: 355 [Syn. Fl. 1^2: 263: Bot. Cal. 1: 347; Man. R. M. 183].

Along streams, at an altitude of 1000–2500 m.

MONTANA: Gallatin River, 1886, *Tweedy, 1108;* Bozeman, 1892, *F. D. Kelsey;* Bozeman Cañon, 1892, *W. T. Shaw.*

YELLOWSTONE PARK: 1884, *Tweedy, 152.*

IDAHO: Henry's Lake, July 31, 1896, *Rydberg & Bessey, 5113.*

Ratibida columnaris (Sims) Don; Sweet, Brit. Fl. Gard. **2**: 361 [Ill. Fl. **3**: 419]; *Rudbeckia columnaris* Sims, Bot. Mag. *pl. 1601; Lepachys columnaris* Torr. & Gray, Fl. N. Am. **2**: 313 [Syn. Fl. **1**²: 264; Man. R. M. 183].

On dry prairies and plains, up to an altitude of 2000 m.

MONTANA: Helena, 1892, *E. N. Brandegee;* Lewis and Clarke Co., *Mrs. Muth;* Custer Co., 1892, *Mrs. Light;* Belt Mts., 1883, *Scribner, 105.*

Ratibida columnaris pulcherrima (DC.) Don; Sweet, Brit. Fl. Gard. **2**: 361; *Obeliscaria pulcherrima* DC. Prod. **5**: 559; *Lepachys columnaris pulcherrima* Torr. & Gray, Fl. N. Am. **2**: 313 [Syn. Fl. **1**²: 264; Man. R. M. 184].

MONTANA: Helena, 1891, *F. D. Kelsey;* Lewis and Clarke Co., *Mrs. Muth.*

Brauneria pallida (Nutt.) Britton, Mem. Torr. Bot. Club, **5**: 333 [Ill. Fl. **3**: 420]; *Rudbeckia pallida* Nutt. Journ. Acad. Sci. Phila. **7**: 77; *Echinacea angustifolia* DC. Prod. **5**: 554 [Syn. Fl. **1**²: 258; Man. R. M. 182].

On dry prairies, up to an altitude of 2500 m.

MONTANA: *John Pearsall* (Mullan Expedition), *917;* Bozeman, 1884, *Tweedy, 151.*

YELLOWSTONE PARK: 1883, *Miss Mary Compton.*

Balsamorrhiza sagittata Nutt. Trans. Am. Phil. Soc. (II.) **7**: 350 [Syn. Fl. **1**²: 266; Bot. Cal. **1**: 348; Man. R. M. 184]; *Espeletia sagittata* Nutt. Journ. Acad. Sci. Phila. **7**: 38.

The seeds, thick root and young stalks are used as food by the Indians. On hillsides, at an altitude of 1500–2500 m.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Gallatin Co., 1888, *Tweedy, 226;* Sand Coulee, 1892, *R. S. Williams, 86;* Bozeman, 1882, *Tweedy;* Columbia Falls, *Mrs. Kennedy, 32;* Gallatin Co., *Miss Shipman* and *Mrs. Hodgman;* Bridger Mts., June 11, 1897, *Rydberg & Bessey, 5174;* Bozeman Pass, 1883, *Tweedy;* Bozeman, 1883, *Scribner, 103a;* Missoula, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall:* 1885, *Tweedy, 755.*

Balsamorrhiza Balsamorrhiza (Hook.) Heller, Cat. N. Am. Pl. 7; *Heliopsis? Balsamorrhiza* Hook. Fl. Bor. Am. **2**: 310; *Balsa-*

morrhiza Hookeri Nutt. Trans. Am. Phil. Soc. (II.) **7**: 349 [Syn. Fl. 1^2: 266; Bot. Cal. 1: 348; Man. R. M. 184].

On hillsides, at an altitude of 2000–2500 m.

MONTANA: Spanish Basin, July 1, 1896, *Rydberg & Bessey, 5175.*

Balsamorrhiza incana Nutt. Trans. Am. Phil. Soc. (II.) **7**: 350; *Balsamorrhiza Hookeri incana* Gray, Syn. Fl. 1^2: 266 [Bot. Cal. 1: 348; Man. R. M. 184].

On gravelly hills, at an altitude of 2000–2500 m.

MONTANA: Prickly Pear Cañon, 1886, *R. S. Williams;* Bozeman, 1892, *Mrs. Alderson;* Snowshoe Gulch, 1883, *Canby, 189* (the lower leaves in the last are entire, crenate and cordate).

YELLOWSTONE PARK: 1873, *C. C. Parry, 165.*

Wyethia helianthoides Nutt. Journ. Acad. Phila. **7**: 38 [Syn. Fl. 1^2: 267; Man. R. M. 184].

In valleys, at an altitude of 2000–2500 m.

MONTANA: Beaver Head Co., 1888, *Tweedy, 227;* Fort Ellis, 1883, *Scribner, 103b;* Grasshopper Valley, 1880, *Watson.*

YELLOWSTONE PARK: Indian Creek, 1884, *Tweedy, 161.*

Wyethia amplexicaulis Nutt. Trans. Am. Phil. Soc. (II) **7**: 352 [Syn. Fl. 1^2: 267; Bot. Cal. 1: 350; Man. R. M. 185]; *Espeletia amplexicaulis* Nutt. Journ. Acad. Sci. Phila. **7**: 38.

Grows on bench-lands, at an altitude of 2000–2500 m. The roots and seeds of both are used for food by the Indians, who call them Pe-ik.

MONTANA: Belt Mountains, 1883, *Scribner, 104.*

IDAHO: Henry's Lake, July 31, 1896, *Rydberg & Bessey, 5176.*

Gymnolomia multiflora (Nutt.) Benth. & Hook.; Rothr. Wheeler Rep. 6: 160 [Syn. Fl. 1^2: 269; Man. R. M. 185]; *Heliomeris multiflora* Nutt. Journ. Acad. Sci. Phila. (II.) 1: 141.

River banks, at an altitude of 2000–2500 m.

MONTANA: Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 5180.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 169.*

Helianthus annuus L. Sp. Pl. 904 [Ill. Fl. **3**: 422; Syn. Fl. 1^2: 272; Bot. Cal. 1: 353; Man. R. M. 186].

Along roadsides, in waste places and old fields, up to an altitude of 2500 m.

MONTANA: Helena, 1888, and 1892, *F. D. Kelsey;* Lewis and Clarke Co., *Mrs. Muth;* Centerville, 1883, *Scribner, 107b.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall.*

Helianthus petiolaris Nutt. Journ. Acad. Sci. Phila 2: 115 [Ill. Fl. **3**: 423; Syn. Fl. **1**²: 272; Bot. Cal. **1**: 353; Man. R. M. 186].

Dry prairies and waste places, up to an altitude of 1500 m.

MONTANA: *John Pearsall, 813;* Belt River, 1881, *R. S. Williams, 162;* Gallatin City, 1883, *Scribner, 107a.*

* Helianthus subrhomboideus.

Perennial; stem 3–6 dm. high, terete, striate, tinged with red, sparingly hirsute, simple; leaves opposite, firm, very scabrous, triple-veined, generally not strongly serrate, the basal broadly ovate or obovate-spatulate; stem-leaves rhomboid-ovate or rhomboid-lanceolate, short-petioled, 5–10 cm. long, the uppermost diminutive, lanceolate; heads mostly solitary, sometimes 2 or 3, 1–1.2 cm. high and 1.5–2 cm. in diameter; bracts in 4–5 rows, oblong, acutish, densely white-ciliate on the margins; disk dark brown or purplish; rays about 1.5 cm. long.

Nearest related to *H. scaberrimus*, but differs in the broader and shorter leaves, the less acute bracts, the smaller heads, and generally longer peduncles. It grows on prairies, up to an altitude of about 1000 m.

MONTANA: Sand Coulee, 1885, *R. S. Williams, 249;* Columbia Falls, *Mrs. Kennedy, 6;* Judith Mts., 1882, *R. W. Springer, XXXV.*

NEBRASKA: Keya Paha River, 1893, *Clements, 2866;* Long Pine, 1890, *G. D. Sweezey, 70;* Whitman, 1893, *Rydberg, 1627* (type).

DAKOTA: Mouth of Big Sioux River, 1853, *Hayden Survey;* Upper Missouri, *Nicollet;* Custer, 1892, *Rydberg, 805.*

ASSINIBOIA: Cypress Hills, 1880, *John Macoun;* Souris Plains, 1883, *J. M. Macoun.*

SASKATCHEWAN: 1857–8, *E. Bourgeau.*

* **Helianthus giganteus** L. Sp. Pl. 905 [Syn. Fl. **1**²: 276; Ill. Fl. **3**: 425].

Like *H. Nuttallii*, but with broader more strongly serrate leaves, more numerous heads, and broader bracts which are strongly hirsute. The specimen cited below differs somewhat from the eastern form in that the rays are much longer, the heads larger, and the bracts broader and shorter. A similar specimen was collected by Macoun near Banff, Alberta, in 1891.

MONTANA: Smith River, 1883, *Scribner, 107.*

Helianthus Nuttallii Torr. & Gray, Fl. N. Am. **2**: 324 [Syn. Fl. **1**^{2}: 277; Bot. Cal. **1**: 354; Man. R. M. 186].

In valleys, at an altitude of 1500–2500 m.

Montana: Beaver Head Co., 1888, *Tweedy, 218;* Madison Co., 1886, *Tweedy, 1121;* Judith River, 1886, *R. S. Williams, 426;* Helena, 1892, *F. D. Kelsey.*

Yellowstone Park: Mammoth Hot Springs, 1884, *Tweedy, 171;* Fire Hole River, 1892, *Miss Isabel Mulford.*

* **Helianthus strumosus** L. Sp. Pl. 905 [Ill. Fl. **3**: 427: Syn. Fl. **1**^{2}: 279].

Somewhat related to *H. tuberosus*, but without tubers, and the leaves more narrowly lanceolate. It grows in valleys, up to an altitude of 1500 m.

Montana: Sheep Creek, 1896, *Flodman, 873.*

Helianthella quinquenervis (Hook.) Gray, Proc. Am. Acad. **19**: 10 [Syn. Fl. **1**^{2}: 284; Man. R. M. 188]; *Helianthus quinquenervis* Hook. Lond. Journ. Bot. **6**: 247.

On hillsides, at an altitude of 2000–2500 m.

Montana: Jack Creek, 1886, *Tweedy, 1139;* Little Belt Pass, 1896, *Flodman, 872;* Judith Mountains, 1882, *Canby.*

Yellowstone Park: Soda Butte, 1885, *Tweedy, 751.*

Helianthella uniflora (Nutt.) Torr. & Gray, Fl. N. Am. **2**: 334 [Syn. Fl. **1**^{2}: 285; Man. R. M. 188]: *Helianthus uniflorus* Nutt. Journ. Acad. Sci. Phila. **7**: 37.

On hillsides, at an altitude of 1500–2500 m.

Montana: Gallatin Co., 1886, *Tweedy, 1137;* Lewis and Clarke Co., 1892, *F. D. Kelsey;* Little Belt Mountains, 1896, *Flodman, 871;* Spanish Basin, June 28, *Rydberg & Bessey, 5178;* Bridger, June 14, 1897, *5179;* 1883, *Scribner, 106a.*

Yellowstone Park: 1884, *Tweedy, 170,* in part.

* **Helianthella Douglasii** Torr. & Gray, Fl. N. Am. **2**: 334 [Syn. Fl. **1**^{2}: 285].

Like the preceding, but hirsute and with longer and more spreading bracts, and more acuminate leaves.

Montana: Park Co., 1887, *Tweedy, 299;* Jack Creek, July 19, 1897, *Rydberg & Bessey, 5177.*

Yellowstone Park: 1884, *Tweedy, 170,* in part: 1885, *676.*

Madia glomerata Hook. Fl. Bor. Am. **2**: 24 [Syn. Fl. **1**^{2}: 306; Bot. Cal. **1**: 360; Man. R. M. 191].

In sandy soil and waste places, at an altitude of 1500–2000 m.

MONTANA: Salesville, 1892, *W. T. Shaw;* Great Falls, 1890, *R. S. Williams, 53;* Bridger Mts., 1896, *Flodman, 870;* Trail Creek Divide, 1897, *Rydberg & Bessey, 5180a;* Fort Ellis to the Yellowstone, 1871, *Hayden Survey;* Plains between Little Belt and Crazy Mts., 1882, *Canby;* Grasshopper Valley, 1880, *Watson.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1884, *Tweedy, 147;* Pelican Creek, 1885, *758.*

Coreopsis tinctoria Nutt. Journ. Acad. Phila. **2**: 114 [Ill. Fl. **3**: 432; Syn. Fl. **1**^{2}: 291; Man. R. M. 189].

Wet meadows, up to an altitude of 1500 m.

MONTANA: *John Pearsall, 807.*

Bidens cernua L. Sp. Pl. 832 [Ill. Fl. **3**: 437; Syn. Fl. **1**^{2}: 296; Bot. Cal. **1**: 357; Man. R. M. 189].

River-banks and sandbars, up to an altitude of 2000 m.

MONTANA: Madison Co., 1886, *Tweedy, 1107*; Judith River, 1886, *R. S. Williams, 439;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 5179a;* Dog Creek, 1883, *Scribner, 108.*

* Thelesperma marginatum.

Perennial, about 2 dm. high, leafy below, naked or with a few bract-like leaves above, glabrous and somewhat glaucous; leaves pinnately divided, with 1 or 2 pairs of linear lobes, which are scarcely wider than the rachis; peduncle about 1 dm. long with 1 head, seldom 2, involucre broadly campanulate, connate to the middle, its lobes ovate with a very broad white scarious margin, the outer bracts lanceolate, about one-third as long as the inner; lobes of the corolla ovate-lanceolate, much shorter than the cylindric tube; ray-flowers none.

Resembles *T. ambiguum* in habit, but the heads are much more like those of *T. gracile.* It differs, however, from both in the broad-margined bracts and the longer tube of the disk-corollas.

MONTANA: Great Falls, 1891, *R. S. Williams, 80;* Lewis and Clarke Co., *Mrs. Muth;* Helena, 1892, *Mrs. Muth;* Sweet Grass Creek, 1889, *Tweedy.*

ASSINIBOIA: Medicine Hat, 1894, *John Macoun, 5073* (type).

Hymenopappus filifolius Hook. Fl. Bor. Am. **1**: 317 [Ill. Fl. **3**: 446; Syn. Fl. **1**^{2}: 336; Man. R. M. 194].

On dry hills and plains, up to an altitude of 1500 m.

MONTANA: Helena, 1889, *F. D. Kelsey;* Beaver Head Co., 1888, *Tweedy, 220;* Great Falls, 1891, *R. S. Williams, 248;* 1886, *F. W. Anderson, 241;* Martindale, 1882, *Canby;* Gallatin City, 1883, *Scribner, 111a.*

* **Hymenopappus luteus** Nutt. Trans. Am. Phil. Soc. (II.) **7**: 374.

Like the last, but lower, subscabrous, and densely white-tomentose. On very dry hillsides, at an altitude of 1500–2000 m.

MONTANA: Melrose, 1895, *Rydberg, 2938;* Helena, 1892, *Mrs. Muth.*

Eriophyllum integrifolium (Hook.) Greene, Fl. Fran. 444; *Trichophyllum integrifolium* Hook. Fl. Bor. Am. **1**: 316; *Eriophyllum caespitosum integrifolium* Gray, Proc. Am. Acad. **19**: 25 [Syn. Fl. **1**^{2}: 331; Man. R. M. 192].

On hills and mountain-sides, at an altitude of 2000–2500 m.

MONTANA: Cliff Lake, July 27, 1897, *Rydberg & Bessey, 5182.*

YELLOWSTONE PARK: 1885, *Tweedy, 150.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5181.*

* **Eriophyllum multiflorum** (Nutt.); *Trichophyllum multiflorum* Nutt. Journ. Acad. Sci. Phila. **7**: 35.

Like the last, but the leaves more or less pinnately dissected, loosely lanate, sparingly so on the upper and densely on the lower surface; heads and bracts larger, the latter acute and acuminate. Nuttall describes the involucre as consisting of 8 bracts. The specimens in the Torrey Herbarium of the original collection have 10–14 bracts. Except Wyeth's specimen, there is in the Columbia Herbarium only one plant that can be referred here, this was collected by Miss Isabel Mulford in 1892, near Corvallis, Oregon.

MONTANA: Towards the sources of the Missouri, *Wyeth.*

* **Eriophyllum leucophyllum** (DC.); *Bahia leucophylla* DC. Prod. **5**: 657; *Eriophyllum caespitosum leucophyllum* Gray, Syn. Fl. **1**^{2}: 331.

Like *E. integrifolium*, but the leaves are cleft or parted, and the achenes with unequal paleae.

YELLOWSTONE PARK: Hot Sulphur Springs, 1871, *Hayden Survey.*

Chaenactis Douglasii H. & A. Bot. Beech. 354 [Syn. Fl. 1^2: 341; Bot. Cal. 1: 391; Man. R. M. 194].

On hillsides and in sand-draws and dried up river beds, at an altitude of 1000–2500 m.

MONTANA: *Wyeth;* Little Blackfoot River, 1860, *Cooper;* Madison Co., *Mrs. Flora McNulty;* Lower Falls of Missouri, 1886, *R. S. Williams, 81;* Spanish Basin, 1896, *Flodman, 874;* Musselshell River, *875;* Garrison, 1895, *Rydberg, 2939;* Melrose, *2940;* Indian Creek, July 21, 1897, *Rydberg & Bessey, 5183;* Spanish Basin, June 23, *5184;* Madison Valley, 1871, *Hayden Survey;* Sixteen Mile Creek, 1883, *Scribner, 112.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Mammoth Hot Springs, 1884, *Tweedy, 167;* 1883, *Dr. J. S. Newberry.*

* **Chaenactis achillaefolia** Hook. & Arn. Bot. Beech. 354.

Lower than the preceding, seldom more than 1 dm. high, densely white-tomentose, and with crowded leaves. It grows in alkaline soil, especially in the hot-spring formations, at an altitude of about 2500 m.

YELLOWSTONE PARK: 1883, *Miss Mary Compton;* Biscuit Basin, Aug. 5, 1897, *Rydberg & Bessey, 5187;* Lower Geyser Basin, Aug. 4, *5188.*

Chaenactis alpina (Gray) Jones, Proc. Cal. Acad. (II.) 5: 699; *Chaenactis Douglasii alpina* Gray, Syn. Fl. 1^2: 341 [Man. R. M. 195].

On the tops of the higher mountains, at an altitude of nearly 3000 m.

MONTANA: Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 5185;* Indian Creek, July 22, *5186;* Lake Plateau, 1897, *P. Koch, 27* and *40.*

Bahia oppositifolia Nutt.; Torr. & Gray, Fl. N. Am. 2: 376 [Ill. Fl. 3: 448; Syn. Fl. 1^2: 332; Man. R. M. 192]; *Trichophyllum oppositifolium* Nutt. Gen. 2: 167.

Dry hills, plains and alkali flats, up to an altitude of 1500 m.

MONTANA: Livingston, 1887, *F. Tweedy, 380;* Great Falls, 1885, *F. W. Anderson, 240;* 1891, *R. S. Williams, 56;* Custer Co., 1892, *Mrs. Light;* Sun River Crossing, 1883, *Scribner, 111.*

*Hulsea carnosa.

Very fleshy; stems from creeping rootstocks and a deep thick root, in big clumps, 1.5–3 dm. high, very leafy throughout, pubescent, more or less viscid; leaves very fleshy, linear, sinuately lobed, except the sometimes petiole-like lower portion, viscidly pubescent, 5–8 cm. long: head solitary, 1.5–2 cm. high, hemispheric, its bracts linear-lanceolate, viscid-pubescent and more or less villous: rays light yellow, less than 1 cm. long: achenes tapering downward, densely silky-strigose; pappus of fimbriate scales, about 2 mm. long.

Nearly related to *H. nana*, but differs in the leafy stem, the more hemispheric head, and the shorter rays. It may possibly be the same as *H. nana Larseni* Gray, but that is described as being more woolly than *H. nana*, which is not the case with the present species, which, if anything, is less woolly.

Grows among rocks, at an altitude of about 3000 m. It is a rather rare plant.

MONTANA: Indian Creek, July 22, 1897, *Rydberg & Bessey, 5194:* Mt. Chauvet, July 29, *5195:* Lone Mountain, 1886, *Tweedy, 1119*.

YELLOWSTONE PARK: Electric Peak, Aug. 18, *Rydberg & Bessey, 5195a;* Mt. Holmes, 1884, *Tweedy, 178*.

Tetraneuris acaulis (Pursh) Greene, Pittonia, **3**: 265: *Galardia acaulis* Pursh, Fl. Am. Sept. 743; *Actinella acaulis* Nutt. Gen. **2**: 173 [Syn. Fl. 1^2: 345; Man. R. M. 195]; *Picradenia acaulis* Britton, Ill. Fl. **3**: 449.

On dry hills, up to an altitude of 2500 m.

MONTANA: Fort Benton, *John Pearsall, 926;* Livingston, 1889, *F. Tweedy;* Great Falls, 1886, *F. W. Anderson, 243;* 1891, *R. S. Williams, 82;* Lewis and Clarke Co., *Mrs. Muth;* Billings, 1882, *Canby;* Madison River, 1883, *Scribner, 112a*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall*.

Rydbergia grandiflora (Torr. & Gray) Greene, Pittonia, **3**: 270; *Actinella grandiflora* Torr. & Gray, Journ. Nat. Hist. Soc. Bost. **5**: 110 [Syn. Fl. 1^2: 345: Man. R. M. 196].

On high mountains, at an altitude of 2500–3000 m.

MONTANA: Beaver Head, 1888, *Tweedy, 21;* Rattlesnake Creek, 1887, *21:* Lone Mountain, 1886, *1118:* Lima, 1895, *Rydberg, 2935;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 5193*.

Picradenia Richardsonii Hook. Fl. Bor. Am. **1**: 317: *Actinella Richardsonii* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 379 [Syn. Fl. 1^2: 347; Bot. Cal. **1**: 394; Man. R. M. 196].

Dry plains, up to an altitude of 1500 m.

MONTANA; Fort Benton, *John Pearsall, 905;* Madison Co., 1888, *Tweedy, 23;* Great Falls, 1886, *R. S. Williams, 244;* 1891, *351;* Manhattan, 1895, *Rydberg, 2936.*

Dugaldea Hoopesii (Gray); *Helenium Hoopesii* Gray, Proc. Acad. Sci. Phila. **1863**: 65 [Syn. Fl. **1**²: 347; Bot. Cal. **1**: 392; Man. R. M. 196].

This is evidently congeneric with *H. integrifolium* of Mexico, on which Cassini founded his genus *Dugaldia;* it was also the type of the later genus *Oxylepis*, of Bentham. The generic characters distinguishing it from *Helenium* are given in the Synoptical Flora, where Dr. Gray recognizes it as a subgenus, and less completely in Coulter's Manual as the first section of *Helenium.* I have seen no specimens of *Dugaldia Hoopesii* from Montana; but it is reported from there, according to Dr. Gray. It grows in adjacent Wyoming.

Helenium montanum Nutt. Trans. Am. Phil. Soc. (II.) **7**: 384; *Helenium autumnale* Gray, Bot. Cal. **1**: 393 [Syn. Fl. **1**²: 349, in part; Man. R. M. 196]; not L.

H. montanum, which represents the eastern *H. autumnale* in the Rocky Mountain region, differs from that species in the narrowly lanceolate, not oblong-ovate or ovate-lanceolate leaves, which are less sharply dentate, smaller heads in a contracted corymbose panicle, and in the whole plant being densely scabrous-hirsutulous. It grows in river valleys and on prairies, its range extending from Mississippi to Nebraska, Saskatchewan, Montana, Nevada and Texas.

MONTANA: Helena, 1891, *F. D. Kelsey;* Whitefish River, 1892, *R. S. Williams, 662;* Banks of the Madison, 1886, *Tweedy, 1106;* Sun River Crossing, 1883, *Scribner, 109;* Heads of the Missouri River, 1882, *Canby.*

Gaillardia aristata Pursh, Fl. Am. Sept. 573 [Ill. Fl. **3**: 452; Syn. Fl. **1**²: 352; Bot. Cal. **1**: 392; Man. R. M. 197].

On prairies and in river-valleys, at an altitude of 1000–2000 m.

MONTANA: Bozeman, 1886, *Tweedy, 1110;* Silver Bow Co., *Mrs. Caspar;* Columbia Falls, *Mrs. Kennedy, 17, 18* and *30;* Helena, 1894, *E. Douglas;* Great Falls, 1891, *R. S. Williams, 87;* Black Hawk, 1896, *Flodman, 875;* Bridger Mountains, *876;* Spanish Basin, *877* and *878;* Deer Lodge, 1895, *Rydberg, 2941;* Jack Creek, July 14, 1897, *Rydberg & Bessey, 5189;* Spanish Basin, July 1, *5190;* June 24, *5191;* Indian Creek, July 21, *5192;* Custer Co., 1882, *Mrs. Light;* Jefferson City, 1883, *Scribner, 110;* Stinking Water, 1871, *Hayden Survey;* Missoula, 1898, *Williams & Griffith.*

Yellowstone Park: Mammoth Hot Springs, 1884, *Tweedy, 105.*

Dysodia papposa (Vent.) A. S. Hitchcock, Trans. St. Louis Acad. 5: 503 [Ill. Fl. 3: 453]: *Tagetes papposa* Vent. Hort. Cels. *pl. 36; Dysodia chrysanthemoides* Lag. Gen. & Spec. Nov. 29 [Syn. Fl. 1²: 356; Man. R. M. 197].

In waste places.

Montana: Helena, 1891, *F. D. Kelsey.*

Achillea lanulosa Nutt. Journ. Acad. Sci. Phila. 7: 36: *Achillea tomentosa* Pursh, Fl. Am. Sept. 563; not L.; *Achillea Millefolium* Gray, Syn. Fl. 1²: 363 [Man. R. M. 198 in part]; not L.

This plant has been included in *A. Millefolium* by American authors but is evidently a good species, differing in the contracted panicle, smaller heads, shorter segments of the leaves, and the lanate pubescence. The true *A. Millefolium* is found in the Eastern United States, and is apparently an introduced plant. Most specimens from the Rocky Mountain Region belong to *A. lanulosa* and none to *A. Millefolium.* There are about half a dozen species in North America but only *A. lanulosa* is found in Montana.

It grows there at nearly all elevations.

Montana: Helena, 1892, *F. D. Kelsey;* Spanish Basin, 1896, *Flodman, 889;* Silver Bow Co., *Mrs. Moore;* Bridger Mountains, June 17, 1897, *Rydberg & Bessey, 5196;* Spanish Basin, June 23, *5197;* Madison River, 1883, *Scribner, 112b.*

Yellowstone Park: 1885, *Tweedy, 752.*

Achillea lanulosa alpicola.

Low, often less than 1 dm. high; involucral bracts with a dark brown or almost black margin. It grows at an altitude of about 3000 m.

Montana: Electric Peak, 1897, *Rydberg & Bessey.*

Wyoming: Teton Forest Reserve, 1897, *Tweedy, 516* (type).

Matricaria matricarioides (Less.) Porter, Mem. Torr. Bot. Club, 5: 341 [Ill. Fl. 3: 460]; *Artemisia matricarioides* Less. Linnaea, 6: 210; *Matricaria discoidea* DC. Prod. 6: 50 [Syn. Fl. 1²: 364; Man. R. M. 199; Bot. Cal. 1: 401].

Grows in sandy soil, waste places, old fields, etc., at an altitude of less than 2000 m.

MONTANA: Willow Creek, 1888, *R. S. Williams, 783;* Bozeman, 1896, *Flodman, 890.*

Chrysanthemum Leucanthemum L. Sp. Pl. 888 [Syn. Fl. 1^2: 365; Man. R. M. 199; Ill. Fl. 3: 457; Bot. Cal. 1: 401].

The "Ox-eye Daisy," a native of Europe, has established itself in the East. In the Rocky Mountain region it is found only occasionally introduced.

MONTANA: Lewis and Clarke Co., *Mrs. Muth;* Pyrenees, *Mrs. Moore.*

Sphaeromeria argentea Nutt. Trans. Am. Phil. Soc. (II.) 7: 402; *Tanacetum Nuttallii* Torr. & Gray, Fl. N. Am. 2: 415 [Syn. Fl. 1^2: 367; Man. R. M. 199].

The genus differs from *Tanacetum* proper in having pappus, obsolete or none, curved or conical receptacle, less dissected or entire leaves, and low habit. I have seen no specimen from Montana, but it may be found there, as it occurs in the neighboring states.

YELLOWSTONE PARK: 1873, *C. C. Parry, 179.*

Sphaeromeria capitata Nutt. Trans. Am. Phil. Soc. (II.) 7: 402; *Tanacetum capitatum* Torr. & Gray, Fl. N. Am. 2: 415 [Syn. Fl. 1^2: 367; Man. R. M. 199].

Rare in southern Montana and the Park, at an altitude of about 3000 m.

MONTANA: Beaver Head Rock, 1888, *Tweedy, 18.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 178.*

Artemisia spinescens D. C. Eaton, King's Exped. 5: 180 [Syn. Fl. 1^2: 368; Man. R. M. 199; Bot. Cal. 1: 404].

Rare in southern Montana. It grows on dry barren hills, up to an altitude of 200 m.

MONTANA: Beaver Head Co., 1888, *Tweedy, 19.*

Artemisia Canadensis Michx. Fl. Bor. Am. 2: 129 [Syn. Fl. 1^2: 368; Man. R. M. 200; Ill. Fl. 3: 462].

In the prairie region, up to an altitude of about 2000 m.

MONTANA: Columbia Falls, *Mrs. Kennedy;* Fridley, 1887, *Tweedy, 312;* Clear Creek, 1883, *Canby, 197.*

Artemisia borealis Pall. Reise, 3: 129 [Syn. Fl. 1^2: 368; Man. R. M. 200; Ill. Fl. 3: 462].

No specimen has been seen by me from the region, but from its range it may be expected to be found on some of the highest peaks.

Artemisia pedatifida Nutt. Trans. Am. Phil. Soc. (II.) **7**: 399 [Syn. Fl. **1**^{2}: 368: Man. R. M. 200].

Rare, on dry hills, at altitudes of 2500–3000 m.

YELLOWSTONE PARK: 1873, *C. C. Parry, 180.*

Artemisia dracunculoides Pursh, Fl. Am. Sept. 742 [Syn. Fl. **1**^{2}: 369; Man. R. M. 200; Ill. Fl. **3**: 463].

In the plain regions, up to an altitude of over 2000 m.

MONTANA: Fridley, 1887, *Tweedy, 314:* Rainbow Falls, 1885, *R. S. Williams, 255;* Smith River, 1883, *Scribner, 114;* Billings, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: Indian Creek, 1884, *Tweedy, 187.*

Artemisia scopulorum Gray, Proc. Acad. Sci. Phila. **1863**: 66 [Syn. Fl. **1**^{2}: 369; Man. R. M. 200].

A truly alpine plant, growing among rocks, at an altitude of about 3000 m.

MONTANA: Park Co., 1887, *Tweedy, 313;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 5212:* Lake Plateau, 1897, *P. Koch, 32* and *54.*

YELLOWSTONE PARK: 1873, *C. C. Parry, 183;* 1884, *Tweedy, 190.*

Artemisia frigida Willd. Sp. Pl. **3**: 1838 [Syn. Fl. **1**^{2}: 369; Man. R. M. 201; Ill. Fl. **3**: 464].

Belongs really to the plains region, growing on dry hills, but extends into the mountains, up to an altitude of 2000 m.

MONTANA: Bear Creek, 1887, *Tweedy, 315:* Bozeman, 1897, *H. S. Jennings;* Rainbow Falls, 1885, *R. S. Williams, 246;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey;* Prickly Pear Valley, 1883, *Scribner, 155.*

YELLOWSTONE PARK: 1884, *Tweedy, 188:* Mammoth Hot Springs, 1885, *693.*

Artemisia biennis Willd. Phytogr. 11 [Syn. Fl. **1**^{2}: 370: Man. R. M. 201; Ill. Fl. **3**: 465].

On river banks, open grounds, waste places, etc., up to an altitude of 1500 m.

MONTANA: Park Co., 1887, *Tweedy, 307;* Great Falls, 1886, *R. S. Williams, 535:* Helena, 1892, *F. D. Kelsey;* Musselshell River, 1896, *Flodman, 888.*

Artemisia longifolia Nutt. Gen. 2: 142 [Syn. Fl. 1^2: 372; Man. R. M. 202].

Belongs rather to the plain region and is therefore found apparently only in the eastern part of the state.

Montana: Milk River, 1889, *V. Havard;* Snowy Mountains, *1882, Canby.*

* **Artemisia rhizomata** A. Nelson, Bull. Torr. Bot. Club, Ja. 1900.

A small species related to *A. longifolia* and *A. gnaphaliodes*, characterized by its small leaves, which are mostly entire or the lower with 2–3 teeth or lobes, the long horizontal rootstock, a very fine tomentum, small and slightly tomentose involucres and a panicle of simple erect spikes. It grows in sandy soil, at an altitude of 1000–2000 m.

Montana: Hell Gate, 1860, *Dr. J. Cooper.*

Idaho: Henry Lake, July 31, 1897, *Rydberg & Bessey, 5211.*

* **Artemisia Purshiana** Besser, Nouv. Mem. Soc. Nat. Mosc. 3: 59.

This was included in *A. Ludoviciana* by Dr. Gray. As he has characterized that plant, it includes not less than six species, viz.: *A. gnaphaliodes* Nutt., *A. Ludoviciana* Nutt., *A. Purshiana* Bess., and the three following ones. The first two I have not seen from Montana or the Park, although they may be found in the eastern portion of the State. *A. Purshiana* has broad almost ovate leaves, generally white on both sides, entire or quite often with a few short triangular lobes, and comparatively large heads. It grows at an altitude of 1000–2000 m.

Montana: Rainbow Falls, 1885, *R. S. Williams, 243;* Silver Bow Co., *Mrs. Jennie Moore;* Musselshell River, 1896, *Flodman, 887;* Lima, 1895, *Rydberg, 2944;* Missouri River, 1883, *Scribner, 113.*

* **Artemisia latiloba** (Nutt.); *Artemisia Ludoviciana latiloba* Nutt. Trans. Am. Phil. Soc. (II.) 7: 400; Torr. & Gray, Fl. N. Am. 2: 420.

This has broad leaves, with triangular or lanceolate acute divergent lobes, in age more or less glabrate above, and comparatively large tomentose heads in dense clusters. The leaves resemble those of *A. Tilesii* and *A. elatior*, but the involucre is more tomentose. Altitude about 2000 m.

Montana: Madison Co., 1887, *Tweedy, 308;* Park Co., 1887.

* **Artemisia candicans** Rydberg, Bull. Torr. Bot. Club, **24**: 296.

This species has once or twice pinnately divided leaves which are grayish above, white beneath, and with oblong segments, and comparatively large heads, 5–8 mm. wide, with tomentose bracts. It grows on hillsides and in sandy soil, at an altitude of about 2000 m.

MONTANA: Little Belt Mountains, 1896, *J. H. Flodman, 882.*

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 5204* (2 depauperate specimens).

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5205.*

* **Artemisia floccosa** Rydberg, Bull. Torr. Bot. Club, **24**: 297.

The leaves of this species are white-tomentose on both sides, and have narrowly oblong or linear-oblong segments. The heads are somewhat smaller than in the preceding, with densely tomentose involucres. In well developed specimens the heads are mostly pedicelled, and were so described in the original description, but they are not always so. In the Yellowstone Park specimens the leaves have narrower segments than in the type. It grows at an altitude of 2000–2500 m.

MONTANA: Lima, 1895, *Rydberg, 2492.*

YELLOWSTONE PARK: Lake, 1884, *Tweedy, 185;* 1885, *691.*

* **Artemisia elatior** (Torr. & Gray); *Artemisia Tilesii elatior* Torr. & Gray, Fl. N. Am. **2**: 422; *Artemisia vulgaris Californica* Gray, Syn. Fl. 1^2: 373, in part; not *A. Californica* Less.

The true *A. vulgaris* is not a native of America and only found introduced in the East. Its leaves are generally more or less twice compound, with oblong or spatulate segments, while the American representatives have simply pinnately divided leaves with lanceolate acute or acuminate segments. The northern *A. Tilesii* has rather few large heads in a glomerate inflorescence; *A. elatior* has rather large nodding heads in an ample panicle; while a third species from the Pacific coast has small cylindric heads, but otherwise resembles *A. elatior.*

MONTANA: Belt Park, 1886, *R. S. Williams, 208;* Bozeman, 1895, *Rydberg, 2944;* Belt Mountains, 1883, *Scribner, 117.*

Artemisia incompta Nutt. Trans. Am. Phil. Soc. (II.) **7**: 400; *A. discolor incompta* Gray, Syn. Fl. 1^2: 373 [Man. R. M. 202].

This I think is a good species, more related to *A. vulgaris* than to *A. discolor.* From the former it differs mostly in the form of the segments of the leaves. It grows on hillsides, at an altitude of 2000–2500 m.

MONTANA: Park Co., 1887, *Tweedy, 309;* Yogo, 1896, *Flodman, 885;* Sweet Grass Cañon, *886;* Emigrant Gulch, Aug. 23, 1897, *Rydberg & Bessey, 5206;* Indian Creek, July 21, *5207;* Missoula, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: Indian Creek, 1884, *Tweedy, 186.*

Artemisia discolor Dougl.; DC. Prod. **7**: 109 [Syn. Fl. **1**^{2}: 373; Man. R. M. 202; Bot. Cal. **1**: 404].

Fairly common on the higher peaks, at an altitude of 2500–3000 m.

MONTANA: Park Co., 1887, *Tweedy, 360;* Haystack Peak, 1887, *310;* Sun River Cañon, 1887, *R. S. Williams, 709;* Little Belt Mountains, 1896, *Flodman, 883* and *884;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 5208;* Electric Peak, Aug. 18, *5209* and *5210* (the latter number with larger nodding heads; may be a hybrid with *scopulorum*); Woodruff's Falls, 1883, *Canby, 196.*

* **Artemisia graveolens** Rydb. Bull. Torr. Bot. Club, **24**: 296.

Similar to *A. discolor*, but glabrous, except occasionally slightly grayish puberulent on the lower surface of the leaves; whole plant heavy-scented and covered with glutinous dots. On mountains, at an altitude of 2500 m.

MONTANA: Long Baldy, Little Belt Mountains, 1896, *Flodman, 881.*

* Artemisia tenuis.

Stem very slender, glabrous or minutely puberulent, branched and leafy; leaves about 2 cm. long, green above, slightly white-tomentulose beneath, deeply divided into 5–7 linear acute divergent segments; inflorescence with slender raceme-like branches; heads on very slender but short pedicels, subtended by a bract-like linear-lanceolate leaf, erect, about 4 mm. high, the bracts brownish, minutely puberulent, ovate, not at all tomentose, and with a scarious erose margin; corolla brown.

A near relative of *A. Lindleyana*, from which it differs in the taller very slender stem, a much scantier pubescence, the slender raceme-like branches of the inflorescence, and the smaller erect brown heads. It fits the description of *A. Prescottiana*, except that the segments of the leaves are not filiform. It was found growing in sandy soil in a cañon, at an altitude of about 1500 m.

MONTANA: Emigrant Gulch, August 23, 1897, *Rydberg & Bessey, 5201.*

* **Artemisia tenuis integerrima.**

Less slender; leaves all, except the very lowest, lanceolate, entire, 2–3 cm. long; involucre more greenish.

May be a good species, but the material is too meager, consisting of only two specimens. Growing with the type.

MONTANA: Emigrant Gulch, August 23, *Rydberg & Bessey, 5201a.*

Artemisia tripartita; *Artemisia trifida* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 398, 1841 [Syn. Fl. **1**^{2}: 375; Man. R. M. 203; Bot. Cal. **1**: 405]: not Turcz. 1832.

Rare in the region, growing on dry hills, plains, etc.

YELLOWSTONE PARK: 1883, *Miss Mary Compton.*

Artemisia arbuscula Nutt. Trans. Am. Phil. Soc. (II.) **7**: 398 [Syn. Fl. **1**^{2}: 374; Man. R. M. 203; Bot. Cal. **1**: 405].

On plains and valleys, at an altitude of 2000–3000 m.

MONTANA: Ennis, 1886, *Tweedy, 1105;* Radersburg, 1882, *Canby.*

YELLOWSTONE PARK: 1884, *Tweedy, 189;* Upper Geyser Basin, Aug. 8, 1897, *Rydberg & Bessey, 5203.*

Artemisia tridentata Nutt. Trans. Am. Phil. Soc. (II.) **7**: 398 [Syn. Fl. **1**^{2}: 374; Man. R. M. 203; Ill. Fl. **3**: 468; Bot. Cal. **1**: 405].

Rather common on dry hills and plains, at an altitude of 1000–2500 m.

MONTANA: Belt River, 1886, *R. S. Williams, 432;* Helena Valley, 1883, *Scribner, 116.*

YELLOWSTONE PARK: 1885, *Tweedy, 694;* Yellowstone Falls, Aug. 14, 1897, *Rydberg & Bessey, 5202.*

Artemisia cana Pursh, Fl. Am. Sept. 521 [Syn. Fl. **1**^{2}: 375; Man. R. M. 203; Ill. Fl. **3**: 468].

Common on dry hills, etc., in the eastern and central parts of Montana, up to an altitude of 2500 m.

MONTANA: Bozeman, 1897, *H. S. Jennings;* Livingston, 1883, *Tweedy, 934;* Park Co., 1887, *Tweedy;* Madison Co., 1887, *311;* Custer Co., 1892, *Mrs. Light.*

YELLOWSTONE PARK: 1883, *Miss Mary Compton;* 1885, *Tweedy, 690;* Yellowstone Falls, Aug. 14, 1897, *Rydberg & Bessey, 5199;* Yellowstone Lake, Aug. 12, *5200*; Yellowstone Lake, 1872, *Coulter.*

Arnica latifolia Bong. Veg. Sitch. 147 [Syn. Fl. 1^2: 381: Man. R. M. 205: Bot. Cal. 1: 415].

In the woods, at an altitude of 2000–2500 m. It is very variable or may contain several distinct species.

MONTANA: Park Co., 1887, *Tweedy, 322;* Tiger Butte, 1888, *R. S. Williams, 443:* Spanish Peaks, 1896, *Flodman, 898;* Bozeman, 1895, *Rydberg, 2946;* Bridger Mountains, June 15, 1897, *Rydberg & Bessey, 5228* (a single small specimen); Pony, July 7, *5230;* McDonald's Peak, 1883, *Canby, 199.*

YELLOWSTONE PARK: 1885, *Tweedy, 687;* Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 5227.*

Arnica cordifolia Hook. Fl. Bor. Am. 1: 331 [Syn. Fl. 1^2: 381; Man. R. M. 205; Ill. Fl. **3**: 471; Bot. Cal. 1: 415].

A very common plant throughout the woody regions of Montana and the Park, from 1000–3000 m. altitude.

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Yellowstone Co., 1886, *Tweedy, 1134;* Upper Sand Coulee, 1888, *R. S. Williams, 23;* Columbia Falls, *Mrs. Kennedy, 8;* Gallatin Co., *Mrs. Alderson;* Bridger Mountains, 1896, *Flodman, 896*; Little Belt Mountains, *897:* Bozeman, 1895, *Rydberg, 2845*; Jack Creek, July 14, 1897, *Rydberg & Bessey, 5233;* Spanish Basin, June 28, *5234;* Bridger Mountain, June 17, *5235:* Pony, July 9, *5236:* Jefferson River, 1883, *Scribner, 124a.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall:* Mammoth Hot Springs, 1885, *Tweedy, 686:* 1884, *180.*

* Arnica pumila.

Stem low, generally 1–2 dm., seldom 3 dm., high, more or less hirsute, and the upper portion somewhat woolly and glandular: leaves comparatively firm, ovate, the basal ones petioled; stem-leaves 1–2 pairs, very short-petioled or sessile, all puberulent; head turbinate, about 2 cm. high; bracts oblong-lanceolate, acute, puberulent and slightly villous at the base; achenes slightly tapering upward, puberulent.

Nearest related to *A. cordifolia*, but is a smaller plant with smaller heads, and smaller and thicker leaves, which are not cordate at the base.

MONTANA: Silver Bow Co., *Mrs. Jennie H. Moore;* Bozeman, 1892, *W. T. Shaw;* Bear Gulch, 1887, *Tweedy, 324.*

UTAH: 1875, *C. C. Parry, 59.*

COLORADO: 1872, *J. Torrey* (type).

* **Arnica gracilis** Rydberg, Bull. Torr. Bot. Club, **24**: 297.

Resembles a depauperate *A. latifolia*, but its basal leaves are broadly ovate, not cordate, the head is smaller, the involucre glandular-puberulent, and the leaves and stem glabrate. It grows on mountain-sides, at an altitude of 2000–3000 m.

MONTANA: Spanish Peaks, 1896, *Flodman, 901;* Spanish Basin, June 28, 1897, *Rydberg & Bessey, 5229;* Cedar Mountain, July 16, 1897, *5231;* Pony, July 7, *5232;* Lake Plateau, 1897, *P. Koch, 57.*

* **Arnica amplexifolia**; *Arnica amplexicaulis* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 408, 1841 [Gray, Syn. Fl. 1^2: 381]; not Wall., 1837.

Distinguished from the following species by its large half-clasping stem-leaves. It is found only in the western part of Montana.

MONTANA: Columbia Falls, *Mrs. Kennedy, 19* and *24.*

Arnica Chamissonis Less. Linnaea, **6**: 238 [Syn. Fl. 1^2: 381; Man. R. M. 205: Ill. Fl. **3**: 472; Bot. Cal. **1**: 416].

In rich soil in the valleys, at an altitude of 1000–2000 m.

MONTANA: Park Co., 1887, *Tweedy, 321;* Columbia Falls, *Mrs. Kennedy, 23;* Little Belt Mountains, 1896, *Flodman, 893.*

* **Arnica mollis** Hook. Fl. Bor. Am. **1**: 331 [Torr. & Gray, Fl. N. Am. **2**: 450; Bot. Cal. **1**: 415].

Differs from the preceding in its short and broad mostly entire leaves, the lower of which are generally blunt, villous pubescence, and larger heads. It grows in wet soil, at an altitude of 1500–2500 m.

MONTANA: Park Co., 1887, *Tweedy, 323;* Gallatin Co., 1886, *Tweedy.*

YELLOWSTONE PARK: Yellowstone Lake, 1894, *F. H. Burglehaus, 564;* Pelican Peak, 1885, *Tweedy, 683* and *684.*

Arnica longifolia D. C. Eaton, King's Exped. **5**: 186 [Syn. Fl. 1^2: 382; Man. R. M. 205].

Among rocks, at an altitude of about 3000 m.

MONTANA: Yogo, 1896, *Flodman, 884;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 5226.*

YELLOWSTONE PARK: East Fork of the Yellowstone, 1885, *Tweedy, 681.*

Arnica foliosa Nutt. Trans. Am. Phil. Soc. (II.) **7**: 407 [Syn. Fl. 1^2: 382; Man. R. M. 205: Bot. Cal. **1**: 416].

Fairly common in wet meadows, up to an altitude of 1500–2500 m.

MONTANA: *Burke;* Beaver Head Co., 1888, *Tweedy, 224;* Anaconda, 1892, *F. D. Kelsey;* Spanish Basin, July 1, 1897, *Rydberg & Bessey, 5225.*

YELLOWSTONE PARK: Blacktail Deer Creek, 1884, *Tweedy, 181;* 1885, *680;* Shoshone Lake, Aug. 10, 1897, *Rydberg & Bessey, 5224;* Upper Falls, 1871, *Hayden Survey.*

Arnica eradiata (Gray) Heller, Cat. N. Am. Pl. 7; *Arnica angustifolia eradiata* Gray, Proc. Acad. Sci. Phila. **1863**: 68; *A. Parryi* Gray, Am. Nat. 8: 213 [Syn. Fl. 1^2: 382].

In woods in the mountain regions, at an altitude of 1500–2500 m.

MONTANA: Gallatin Co., 1886, *Tweedy, 1132;* Bridger Mts., 1896, *Flodman, 892.*

YELLOWSTONE PARK: East Pelican River, 1885, *Tweedy, 689;* 1873, *C. C. Parry, 153;* 1885, *Letterman.*

* Arnica monocephala.

Arnica alpina Gray, Syn. Fl. 1^2: 382, mainly; not Olin.

Stem generally 1.5–2 dm. high, densely pubescent, almost pilose, or somewhat hirsute above, generally with two pairs of leaves and a single erect head; basal leaves broadly oblanceolate, entire, tapering into a short petiole, obtuse or acute, 3–7 cm. long, densely pubescent, 3–5-ribbed; stem-leaves lanceolate or linear, sessile and slightly clasping; head 12–15 mm. high and 12–20 mm. in diameter; involucre densely pubescent, not villous, its bracts 10–15, lanceolate, bright green; rays bright yellow, 12–16 mm. long and 4–6 mm. wide; achenes densely hirsute, about equalling the cream-colored pappus.

This is the most common species in the Rocky Mountain region which has gone under the name *Arnica alpina.* The original *A. alpina* is described as densely woolly, and there is no plant in America, so far as I know, that fits the description. There is only one from Labrador that is more or less villous, but that is probably not *A. alpina. A. angustifolia* Vahl, from Greenland is regarded by European botanists as the same as *A. alpina*, but this is described by Lange, in his Conspectus Florae Groenlandicae, as having an involucre that is much smaller than that of *A. montana* and is attenuate at the base. The involucre of the Labrador plant is fully as large as that of *A. montana*, and the only species with turbinate involucres in the *alpina* group are *A. Lessingii* and *A. Rydbergii*, mentioned below. The Labrador plant is, I think, *A. plantaginea* Pursh, although it is not glabrous as Pursh describes it. *A. alpina*, as characterized by Gray, comprises not less than five distinct species, viz., the present species, the above mentioned Labrador plant, *A. pedunculata* Rydberg, *A. fulgens* Nutt., and *A. Rydbergii* Greene.

Common throughout the northern Rocky Mountain region, growing at an altitude of from 1500–3000 m.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey, 5222;* Bridger Mountains, June 14, *5221* (type); Helena, 1888, *Kelsey;* Jefferson River, 1883, *Scribner, 124c.*

YELLOWSTONE PARK: 1885, *Tweedy, 682.*

* **Arnica fulgens** Pursh, Fl. Am. Sept. 527.

Differs from the preceding in the more coarsely hairy stem, the narrowly linear and more numerous bracts, 15–25 in number, somewhat larger heads, and orange-colored rays. Last year I took up the name *A. fulgens* for another species, not having seen any specimens like those collected this year; the latter agree perfectly with Pursh's description. It grows on hillsides, at an altitude of 2000–3000 m., and is a comparatively rare plant.

MONTANA: Bozeman, 1882, *Tweedy, 407;* Columbia Falls, *Mrs. Kennedy, 7;* Great Falls, 1886, *R. S. Williams;* Bridger Mountains, June 12, 1897, *Rydberg & Bessey, 5220.*

WYOMING: Teton Forest Reserve, 1897, *Tweedy, 530.*

* **Arnica pedunculata** Rydberg, Bull. Torr. Bot. Club, **24**: 297.

Resembles most *A. monocephala*, but is a much taller plant, 3–6 dm. high, with a long-peduncled head, small stem-leaves, and finer pubescence. It grows in open meadows, at an altitude of about 2000 m.

MONTANA: Silver Bow Co., 1888, *Tweedy, 225;* Gallatin Co., *Mrs. Alderson;* Spanish Basin, 1896, *Flodman, 899* and *900;* June 28, 1897, *Rydberg & Bessey, 5223;* Custer Co., 1892, *Mrs. Light.*

* **Arnica Rydbergii** Greene, Pittonia, **4**: 37; *Arnica fulgens* Rydberg, Bull. Torr. Bot. Club, **24**: 297; not Pursh.

Generally rather tall, 3–4 dm. high, striate, sparingly hirsute, usually with 3 or 4 pairs of stem-leaves, and three heads. The basal leaves are ovate-lanceolate with a winged petiole, sinuately dentate, acute; stem-leaves similar, sessile, with a broad clasping sometimes slightly dilated base. The heads are decidedly turbinate, 12–15 mm. high, the bracts rather few, 8–16, lanceolate, sparingly hirsute and puberulent; achenes pubescent. In dry valleys and on hillsides, at an altitude of 2000–2500 m.

MONTANA: Park Co., 1887, *Tweedy, 320;* Little Belt Pass, 1896, *Flodman, 891* (type); Pony, July 7, 1897, *Rydberg & Bessey, 5232* (depauperate form); Little Belt Mts., 1883, *Scribner, 124.*

YELLOWSTONE PARK: East Fork, 1885, *Tweedy, 735.*

Tetradymia canescens DC. Prod. 6: 440 [Syn. Fl. 1^2: 379; Man. R. M. 204; Bot. Cal. 1: 407].

Dry plains and hills, at an altitude of 1000–2000 m.

MONTANA: Gardiner, 1885, *Tweedy, 754;* Lima, 1895, *Rydberg, 2847.*

Tetradymia inermis Nutt. Trans. Am. Phil. Soc. (II.) 7: 415; *Tetradymia canescens inermis* Gray, Bot. Cal. 1: 408 [Syn. Fl. 1^2: 379; Man. R. M. 204].

Dry plains and hills, common, at an altitude of 1000–2000 m.

MONTANA: Pass Creek, *H. Englemann;* Deer Lodge, 1860, *Cooper;* Helena, 1890, *F. D. Kelsey;* Great Falls, 1891, *R. S. Williams, 841;* Bozeman, 1887, *F. Tweedy, 301;* Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 5219;* Cliff Lake, July 27, *5220;* Fort Logan, 1883, *Scribner, 118;* Fort Ellis to the Yellowstone, 1871, *Hayden Survey.*

Tetradymia spinosa Hook. & Arn. Bot. Beech. 360 [Syn. Fl. 1^2: 379; Man. R. M. 204; Bot. Cal. 1: 407].

Rare in southern Montana, at an altitude of about 2000 m.

MONTANA: Big Hole River, Beaver Head Co., 1888, *Tweedy, 22.*

Senecio megacephalus Nutt. Trans. Am. Phil. Soc. (II.) 7: 410 [Syn. Fl. 1^2: 385; Man. R. M. 207].

MONTANA: Columbia Falls, 1892; *R. S. Williams, 936;* Upper Marias Pass and McDonald's Peak, 1883, *Canby, 198.*

Senecio occidentalis (Gray); *Senecio Fremontii occidentalis* Gray, Bot. Cal. 1: 618 [Syn. Fl. 1^2: 386; Man. R. M. 207].

Evidently a good species, growing among rocks, at an altitude of 2500–3000 m.

MONTANA: Mill Creek, 1887, *Tweedy, 338;* Yogo, 1888, *R. S. Williams, 787;* Little Belt Mts., 1896, *Flodman, 917;* Cedar Mts., July 16, 1897, *Rydberg & Bessey, 5239;* Lake Plateau, 1897, *P. Koch, 24;* Little Belt Mts., 1883, *Scribner, 120;* Upper Marias Pass, 1883, *Canby, 201.*

YELLOWSTONE PARK: Mt. Norris and Soda Butte, 1885, *Tweedy, 718;* Electric Peak, Aug. 18, 1897, *Rydberg & Bessey, 5238;* Hood's Basin, 1897, *P. Koch.*

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5237.*

* Senecio occidentalis rotundatus.

Stem slightly over 1 dm. high; leaves rounded-spatulate, slightly sinuate, not toothed; heads somewhat larger and broader, and the bracts broader, oblong, and abruptly acute.

May be a good species, but the material is rather meagre.

MONTANA AND IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5268.*

WYOMING: Breccia Peak, 1897, *Tweedy, 589.*

Senecio triangularis Hook. Fl. Bor. Am. **1**^{2}: 332 [Syn. Fl. 1^2: 386; Man. R. M. 208; Bot. Cal. **1**: 414].

Common on creek-banks and in water, at an altitude of 1000–2000 m.

MONTANA: Bear Creek Cañon, 1892, *W. T. Shaw;* Columbia Falls, *Mrs. Kennedy, 25;* Gallatin Co., 1886, *Tweedy, 1116;* Spanish Basin, 1896, *Flodman, 916;* Bozeman, 1895, *Rydberg & Bessey, 2854;* Spanish Basin, July 1, 1897, *Rydberg & Bessey, 5242;* Little Belt Mts., 1883, *Scribner, 122;* Red Lodge, 1898, *Williams & Griffith.*

YELLOWSTONE PARK: East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 5240* and *5243* (a form with ovate leaves and a smaller corymb).

IDAHO: Henry's Lake, July 31, *Rydberg & Bessey, 5241.*

* **Senecio saliens** Rydberg, Bull. Torr. Bot. Club, **24**: 298.

Differs from *S. triangularis* in the lower stature, and the smaller thick rather fleshy leaves with fewer and less pointed teeth. It is a mountain plant growing among rocks, at an altitude of 2000 m. or more.

MONTANA: Granite, 1892, *F. D. Kelsey;* Yogo Baldy, 1896, *Flodman, 919* (type); McDonald's Peak, 1883, *Canby, 202.*

YELLOWSTONE PARK: 1885, *Tweedy, 721.*

* Senecio variifolius.

Stem very tall, 1 m. or more high, glabrous, angled, branched above; lower leaves comparatively firm, glabrous, cordate, doubly and irregularly dentate with large salient teeth, distinctly petioled, the blade often over 1 dm. long, the upper ovate, short-petioled or sessile;

heads large, 1.5–2 cm. high, in few-headed cymes terminating the branches; bracts linear, more or less broadly scarious-margined; rays few and very short; achenes light-colored, angled, glabrous.

A member of the *triangularis* group, but differs from the rest in the branched habit, the larger heads, and in the leaves, of which the lower are cordate, and the upper ovate, none triangular.

MONTANA: Clendennin, 1882, *R. S. Williams, 205.*

IDAHO: Quartzburg, 1892, *Miss Mabel Mulford.*

Senecio serra Hook. Fl. Bor. Am. **1**: 332 [Syn. Fl. 1^2: 386; Man. R. M. 208].

In wet places in the mountain regions, at an altitude of 1000–2000 m.

MONTANA: Tiger Butte, 1886, *F. W. Anderson, 256;* Bozeman, 1887, *F. Tweedy, 334;* Melrose, 1895, *Rydberg, 2853;* Jack Creek, July 14, 1897, *Rydberg & Bessey, 5244;* Forks of the Madison, July 26, *5245;* Belt Mountains, 1882, *Canby.*

Senecio serra andinus (Nutt.); *Senecio andinus* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 409 [Bot. Cal. **1**: 414]; *Senecio serra integriusculus* Gray, Syn. Fl. 1^2: 387 [Man. R. M. 208].

In similar situations.

MONTANA: Helena, 1889, *F. D. Kelsey;* Silver Bow Co., *Mrs. Helen Dolman;* East Gallatin Swamps, 1896, *Flodman, 915;* Lima, 1895, *Rydberg, 2852;* Forks of the Madison, July 26, 1897, *Rydberg & Bessey, 5246;* Belt Mountains, 1883, *Scribner, 119.*

YELLOWSTONE PARK: Turbid Lake, 1885, *Tweedy, 717;* 1873, *C. C. Parry, 170.*

* Senecio Solidago.

Tall, apparently over 1 meter high, glabrous, very leafy, and much branched; leaves from oval-deltoid to lanceolate, 6–10 cm. long, rather thin, coarsely dentate with salient teeth, short-petioled or subsessile; panicle very large and branched; heads rather small, about 8 mm. high; bracts linear, yellowish, much shorter than the disk; rays pale yellow; achenes small, only 2 mm. long, glabrous.

Apparently nearest related to *S. serra*, but has much broader leaves and a much longer panicle. The plant strikingly resembles *Solidago serotina* in general habit, hence the name.

MONTANA: Tiger Butte, 1886, *R. S. Williams, 264;* Alhambra, 1892, *F. D. Kelsey* (both specimens in the herbarium of the Montana Agricultural College, at Bozeman).

Senecio crassulus Gray, Proc. Am. Acad. **19**: 54 [Syn. Fl. **1**^{2}: 387; Man. R. M. 208].

In wet soil, at an altitude of 1000–2000 m.

MONTANA: Park Co., 1887, *Tweedy*, *339;* Gallatin Co., 1886, *Tweedy;* Bridger Mts., 1886, *Flodman*, *914;* Cedar Mountain, July 16, 1897, *Rydberg & Bessey*, *5249*.

YELLOWSTONE PARK: Pebble Bank, 1885, *Tweedy*, *715*.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey*, *5248* and *5250* (a monocephalous specimen).

* Senecio semiplexicaulis.

Stem 4–6 dm. high, glabrous; lower leaves obovate, tapering into a winged petiole, acute, the upper oblong, more or less clasping by a broad, sometimes slightly auricled, base, acute or often acuminate, all very thin, sinuately dentate and often, especially the uppermost, with salient teeth; cyme with rather few heads on long pedicels; heads 12–15 mm. high, campanulate; bracts oblong, tipped with black, much shorter than the disk; rays narrow, about 8 mm. long: achenes glabrous, cylindric, striate, nearly equalling the pappus in length.

This has been referred to *S. lugens* or some of its varieties, but has very little relationship with it. The relationship is evidently with *S. crassulus*, and it is doubtful if it should not rather be regarded as a variety of that species. The involucral bracts, however, are not very thick and fleshy and the leaves are not of a "firm texture"; this is, without doubt, the reason why it has not been referred to *S. crassulus*. In dry material they are even much more alike than in the fresh state. In wet soil, at an altitude of 2000–3000 m.

YELLOWSTONE PARK: East De Lacy's Creek, August 18, 1897, *Rydberg & Bessey*, *5251* (type): 1884, *Tweedy*, *118*.

IDAHO: Teton Range, 1872, *Coulter*.

UTAH: Wasatch Mountains, 1879, *M. E. Jones*, *1157*.

* Senecio pereziifolius.

Stem 6–8 dm. high, glabrous, striate, somewhat branched above; basal leaves 2–2.5 dm. long, very thin and glabrous, oblong or oval, tapering into a winged petiole, sinuately dentate with small but sharp salient teeth; lower stem-leaves similar, but sessile, the upper ones linear and with entire margins; cyme rather narrow; heads cylindric-campanulate, about 1 cm. high; bracts linear, tipped with black, much shorter than the disk; rays fully 1 cm. long; achenes brown, glabrous, about two-thirds as long as the white pappus.

Perhaps somewhat related to *S. rapifolius*, but cannot be confused with that species, being easily distinguished by the large basal and small stem-leaves, and by the ample rays. It grows in swampy ground, at an altitude of about 2200 m.

MONTANA: Jack Creek, July 15, 1897, *Rydberg & Bessey, 5252.*

Senecio hydrophilus Nutt. Trans. Am. Phil. Soc. (II.) 7: 411 [Syn. Fl. 1^2: 387; Man. R. M. 208].

In wet meadows and on river-banks, at an altitude of 1500–2500 m.

MONTANA: Bozeman, 1895, *Rydberg, 2848;* Gallatin, 1882, *Canby.*

YELLOWSTONE PARK: 1884, *Tweedy, 119;* 1885, *716;* Upper Madison Cañon, Aug. 3, 1897, *Rydberg & Bessey, 5247;* Mud Springs, 1871, *Hayden Survey.*

* Senecio hydrophiloides.

Stem tall, from a clump of fibrous roots, simple up to the inflorescence, glabrous, 6–8 dm. high; lower leaves rather thick, glabrous, lanceolate, with a long winged petiole, sinuately dentate, the upper much reduced, 2–3 cm. long, lanceolate and sessile; cyme more or less compound-corymbiform with divergent branches; heads almost short-cylindric, about 1 cm. high; bracts narrowly linear-lanceolate, nearly equalling the disk; rays rather short and few; achenes light brown, 4-angled, smooth and glabrous.

Nearest related to *S. hydrophilus*, from which it differs in the dentate leaves and the open inflorescence.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 935.*

IDAHO: 1896, *A. A. & E. Gertrude Heller, 3474* (type).

* Senecio Scribneri.

Stout, 2–3 dm. high, from a short erect rootstock with numerous fleshy fibers; stem somewhat villous; basal leaves oval with a somewhat winged petiole, 3–4 cm. long; blade 2–3 cm. long, fleshy; stem-leaves linear or linear-oblong, thick, somewhat villous, 6–8 cm. long, obtuse, the lower tapering into a winged petiole, the upper sessile: inflorescence corymbose, flat-topped; heads 6–16, 12–15 mm. high, 12–20 mm. in diameter, with a few calyculate bractlets; bracts numerous, linear-lanceolate, slightly villous, light colored; rays broad, 12–15 mm. long; achenes sharply angled, glabrous.

Nearest related to *S. aronicoides* and *S. Hookeri*, but differs in the more numerous heads and the narrow leaves. It grows at an altitude of a little over 1500 m.

MONTANA: Livingston, 1883, *Scribner, 123b* (in the Canby Herbarium).

Senecio atriapiculatus; *Senecio Columbianus* Greene, Pittonia, **3**: 170, 1898; not *S. resedifolius Columbiensis* Gray, 1886; *Senecio lugens* Gray, Syn. Fl. 1^2: 388, in part [Bot. Cal. **1**: 413; Man. R. M. 209]; not Richards.

Taller and shorter, more leafy, and with more numerous heads than in the arctic *S. lugens* Richards. On prairies and in river-valleys, up to an altitude of 2500 m.

MONTANA: Upper Sand Coulee, 1888, *R. S. Williams, 850;* Spanish Basin, June 26, 1897, *Rydberg & Bessey, 5254;* Bridger Mountains, June 11, *5256*; Bozeman, 1883, *Scribner, 123a.*

Senecio arachnoideus.

A stout and rather leafy perennial, copiously arachnoid-floccose when young, with a short caudex and a cluster of fibrous roots; stem simple, 3–4 dm. high, striate, in age shining; basal leaves 7–15 cm. long, rather thick, with a winged petiole; blade lanceolate or oblanceolate, acute, irregularly sinuate-dentate; stem-leaves lanceolate, sessile and half clasping with more or less auricled bases, the margins sinuate-dentate and usually considerably wrinkled or crisped; heads in a dense corymbiform cyme, campanulate, 8–12 mm. high and 8–10 mm. broad; bracts linear, acute, thick, conspicuously black-tipped, shorter than the disk, the calyculate ones small, subulate; rays light yellow, 8 mm. long and 2 mm. wide; achenes oblong-cylindric, glabrous, shining.

Nearest related to the preceding, but principally distinguished by the long arachnoid pubescence and the sinuately dentate and crisped leaves. In wet places.

MONTANA: Deer Lodge, 1891, *Kelsey* (type).

IDAHO: Wiessner Peak, 1892, *Sandberg, MacDougal & Heller, 609.*

OREGON: *Wilkes Expedition.*

* Senecio glaucescens.

Perennial, with a very short caudex and a cluster of fibrous roots; glabrous or at first slightly hairy and more or less glaucous; stem 2–7 dm. high, striate, shining, often tinged with red; basal leaves and lower stem-leaves 5–10 cm. long, spatulate or oblanceolate or even oval, callous, dentate or very rarely subentire, acute or obtuse, with a distinct winged petiole, rather thick and often somewhat glaucous; upper stem-leaves reduced, lanceolate and sessile; cyme corymbiform, rather contracted; heads campanulate, about 1 cm. high and 8–12 mm. broad; bracts linear-lanceolate, acute, with conspicuous black tips, and about two-thirds as long as the disk;

rays dark yellow, about 8 mm. long and 2–3 mm. wide; achenes oblong-cylindric, glabrous.

In general habit most resembles *S. microdontus* (Gray) Heller, but lacks the conspicuous rootstock of that species, and the bracts are prominently black-tipped. It is distinguished from the other species of the *lugens* group by the thick leaves and the callous denticulation. Wet places in the mountains, at an altitude of 300–1000 m.

MONTANA: Yogo Baldy, 1896, *Flodman*, *913* (type); Park Co., 1887, *Tweedy*, *337*, at least in part.

IDAHO: Lake Waha, 1896, *A. A. & E. Gertrude Heller*, *3252*; Lewiston, *3100*.

Senecio exaltatus Nutt. Trans. Am. Phil. Soc. (II.) **7**: 410; *Senecio lugens exaltatus* Gray, Bot. Cal. **1**: 413 [Syn. Fl. **1**^{2}: 388; Man. R. M. 209].

In wet meadows, up to an altitude of 2500 m.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall*.

* Senecio altus.

Perennial, with a rather stout rootstock; stems 6–10 dm. high, striate, sparingly woolly when young, leafy below; basal leaves 2–3 dm. long, rather firm, oblanceolate, tapering into a winged petiole, sinuately dentate, more or less woolly on both sides when young; lower stem-leaves similar, smaller, short-petioled or subsessile, the upper much reduced, bract-like, linear-lanceolate, distant; heads in a contracted corymbiform cyme, about 1 cm. high; bracts linear, rather thick, brownish and tipped with black, much shorter than the disk; rays about 8 mm. long, orange to lemon; disk-flowers brownish yellow; achenes hispidulous, especially on the angles, less than half as long as the white pappus.

Nearest related to *S. foliosus*, but is easily distinguished by the large basal and the small upper stem-leaves, the almost naked upper portion of the stem, the small cyme, the dark involucre and disk, and the tallness of the plant. From *S. atratus*, which it resembles in the form and the size of the basal leaves, it differs in the subnaked upper portion of the stem, the smaller cyme, and the larger more campanulate involucres. It grows in wet meadows, at an altitude of about 2000 m.

MONTANA: Spanish Basin, July 1, 1897, *Rydberg & Bessey*, *5258* (type); 1896, *Flodman*, *910* and *912*; Little Belt Mountains, 1883, *Scribner*, *123*.

YELLOWSTONE PARK: 1885, *Tweedy*, *714*.

* Senecio latus.

Stem stout and tall, 6–8 dm. high, striate, more or less densely covered with long white crisped hairs; lower leaves about 1 dm. long, broadly oblanceolate, sinuately toothed, tapering into a short winged petiole, on the upper surface covered with long white hairs, the lower surface almost glabrate except the midrib and margins; upper leaves similar, but rather more strictly lanceolate, and more or less clasping by a broad base; inflorescence a large compound corymb, about 3 dm. high and 2 dm. wide; involucral bracts short, scarcely more than half the length of the fully developed disk, rather fleshy, oblong, abruptly contracted into a slender dark point; achenes greenish, glabrous, bluntly angled and striate, about as long as the white pappus.

In size and habit it most resembles *S. atratus* Greene, from Colorado, but differs in the large open compound corymb, the short fleshy bracts, and the different pubescence, which cannot by any means be said to be tomentose. The same characters, together with the size, separate it from *S. foliosus*.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy*, *28* (type, in the herbarium of Montana Agricultural College, Bozeman.)

* Senecio solitarius.

Stem from a bunch of fibrous roots, 3–4 dm. high, simple, glabrous, monocephalous; lower leaves thin and glabrous, their blades oval, subentire, about 5 cm. long, produced downward into a winged petiole of about the same length; middle leaves lanceolate, with a clasping base, the uppermost reduced, very small and subulate; head nearly 2 cm. high, borne on the somewhat enlarged end of the stem; bracts very numerous, very narrowly linear, tipped with black; rays light yellow, almost 1.5 cm. long; achenes dark brown, glabrous and striate.

In habit it resembles most *S. integerrimus*, and may be taken for a monocephalous form of that species, but the leaves are much thinner, the upper ones much more reduced and subulate, the heads larger, and the bracts more numerous and narrower.

YELLOWSTONE PARK: 1885, *Frank Tweedy*, *813*.

Senecio canus Hook. Fl. Bor. Am. **1**: 333 [Ill. Fl. **3**: 477; Syn. Fl. 1^2: 390; Bot. Cal. **1**: 412; Man. R. M. 210].

On mountain-sides, up to an altitude of 2500 m.

MONTANA: Anaconda, 1892, *F. D. Kelsey;* Granite, 1892, *Kelsey;* Great Falls, 1891, *R. S. Williams*, *78;* Little Belt Mts., 1896, *Flodman*, *907;* Little Belt Mts., 1883, *Scribner*, *121;* Mt. Helena, 1883, *Canby*, *205*.

* **Senecio Purshianus** Nutt. Trans. Am. Phil. Soc. (II.) **7**: 412; *Senecio canus* Gray, Syn. Fl. **1**^{2}: 390, in part; not Hook.

Lower than the preceding, the leaves all entire or the stem-leaves somewhat dentate at the base: tomentum denser; heads much smaller and bracts shorter-pointed. It is more common, growing at an altitude of 2000–3000 m.

MONTANA: Silver Bow Co., *Mrs. Jennie Moore;* Livingston, 1889, *Tweedy;* Cinnabar, 1887, *342;* Helena, 1891, *Kelsey;* Black Hawk, 1896, *Flodman, 902;* Little Belt Pass, *903;* Spanish Basin, *904* and *905;* Bridger Mts., *906;* Bozeman, 1895, *Rydberg, 2849;* Bridger Mts., June 12–17, 1897, *Rydberg & Bessey, 5258;* Spanish Basin, June 23, *5259;* Livingston, 1883, *Scribner, 121a;* Jefferson River, *121b.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Hood's Peak, 1897, *P. Koch, 20.*

* **Senecio Hallii** Britton, Trans. N. Y. Acad. Sci. **9**: 11.

Like *S. canus*, but the whole plant densely white pannose-tomentose, even the involucre. On the geyser formations, at an altitude of 2500 m.

YELLOWSTONE PARK: 1889, *Dr. Chas. H. Hall;* Upper Geyser Basin, Aug. 6, 1897, *Rydberg & Bessey, 5257.*

* **Senecio Howellii** Greene, Bull. Torr. Bot. Club, **8**: 98.

Like *S. canus*, but with narrow often lobed leaves linear in outline, and much sparser pubescence. It grows on dry hills, up to an altitude of 2500 m.

MONTANA: Pony, July 7, 1897, *Rydberg & Bessey, 5261* (a doubtful specimen, with entire leaves, resembling those of *S. werneriaefolia*).

YELLOWSTONE PARK: 1883, *Miss Mary Compton.*

* **Senecio Plattensis** Nutt. Trans. Am. Phil. Soc. (II.) **7**: 413 [Ill. Fl. **3**: 478].

Dr. Gray included this in *S. aureus Balsamitae*, but it is much nearer related to the eastern *S. tomentosus*, as it is more or less floccose when young and has hairy achenes. It has much more divided leaves than *S. tomentosus;* they are lyrate, as in *S. Balsamitae*, but much thicker. It is a typical prairie species, seldom extending to an altitude of more than 1000 m.

MONTANA: Custer Co., 1892, *Mrs. Light.*

* Senecio nephrophyllus.

Stem glabrous, about 4 dm. high, branched above, with erect branches, striate; first basal leaves reniform, thick, slightly wavy, resembling those of *Oxyria digyna;* petioles 3–5 cm. long, the later basal leaves rounded, oval, more or less cordate at the base, sinuate; stem-leaves pinnately sinuate-parted with oblong very obtuse segments and rounded sinuses; panicle with numerous small heads on erect branches; heads rayless, campanulate, 7–9 mm. high; bracts glabrous, linear, 5–6 mm. long, greenish yellow or brownish, with light yellow margins; rays none.

A member of the *aureus* group, most easily distinguished by its rayless heads and peculiar basal leaves. It grows in meadows.

MONTANA: Big Blackfoot River, 1883, *Canby, 203.*

* **Senecio pseudaureus** Rydberg, Bull. Torr. Bot. Club, **24**: 298.

Nearly related to the eastern *S. aureus* and represents it in the Rockies. Its basal leaves resemble somewhat those of that species, but are smaller, narrower, less cordate at the base, and serrate instead of crenate. Grows in wet meadows, at an altitude of 2000–2500 m.

MONTANA: Madison Co., *Mrs. McNulty;* Bear Gulch, 1887, *Tweedy, 340;* Columbia Falls, *Mrs. Kennedy, 9;* Little Belt Mts., 1896, *Flodman, 918;* Spanish Basin, June 28, 1897, *Rydberg & Bessey, 5263;* Indian Creek, July 21, *5264.*

YELLOWSTONE PARK: Lone Star Geyser Basin, Aug. 7, 1887, *Rydberg & Bessey, 5262.*

Senecio Balsamitae Muhl.; Willd. Sp. Pl. 1998 [Ill. Fl. **3**: 479]; *Senecio aureus Balsamitae* Torr. & Gray, Fl. N. Am. **2**: 442 [Syn. Fl. **1**^{2}: 381; Bot. Cal. **1**: 412; Man. R. M. 210].

In meadows, up to an altitude of 2500 m.

MONTANA: Bozeman, 1896, *Flodman, 908;* Deer Lodge, 1895, *Rydberg, 2850;* Jack Creek, July 15, 1897, *Rydberg & Bessey, 5265.*

Senecio crocatus Rydberg, Bull. Torr. Bot. Club, **24**: 299; *Senecio aureus croceus* Gray, Proc. Acad. Sci. Phila. **1863**: 68 [Syn. Fl. **1**^{2}: 391; Man. R. M. 311]; not DC.

In mountain meadows, at an altitude of 2000–2500 m.

MONTANA: Anaconda, 1892, *F. D. Kelsey;* Little Belt Pass, 1896, *Flodman, 910;* Bozeman, 1895, *Rydberg, 2851.*

Senecio cymbalarioides Nutt. Trans. Am. Phil. Soc. (II.) **7**: 412; *Senecio aureus borealis* Torr. & Gray, Fl. N. Am. **2**: 442 [Syn. Fl. **1**^{2}: 391; Bot. Cal. **1**: 412; Man. R. M. 211].

In high mountains, at an altitude of 2500–3000 m.

MONTANA: Park Co., 1887, *Tweedy, 343*, in part; Silver Bow Co., *Mrs. Jennie Moore;* Jack Creek, July 14, 1897, *Rydberg & Bessey, 5266.*

IDAHO: Mt. Chauvet, July 29, *Rydberg & Bessey, 5267.*

Senecio subnudus DC. Prod. 6: 428; *Senecio aureus subnudus* Gray, Syn. Fl. 1²: 391 [Man. R. M. 211].

In swampy places on mountain-tops, at an altitude of 2500–3000 m.

MONTANA: Park Co., 1887, *Tweedy, 344;* Pony, July 7, 1897, *Rydberg & Bessey, 5270.*

YELLOWSTONE PARK: 1884, *Tweedy, 120.*

* Senecio alpicola.

Less than 5 cm. high, glabrate or slightly tomentose when young; basal leaves 1–3 cm. long, thick, elliptic, with a slightly winged petiole, entire, or rarely sinuately 3-toothed at the end; stem-leaves reduced to small bracts on the short-scapose mostly monocephalous stems; heads about 1 cm. high; bracts linear-lanceolate, green or slightly purplish, almost equalling the disk; rays lemon-yellow, about 8 mm. long.

The plant strikingly resembles *S. petrophilus* Greene (*S. petraeus* Gray) of Colorado, and grows in similar situations, but it is somewhat smaller, has almost entire leaves, and lemon- (not orange-) colored rays. It grows among rocks together with *S. occidentalis*, at an altitude of 3000 m.

MONTANA: Cedar Mountain, July 16, 1897, *Rydberg & Bessey, 5269;* East Boulder Plateau, 1887, *Tweedy, 343*, mainly.

* **Senecio resedifolius** Lessing, Linnaea, 6: 243 [Syn. Fl. 1²: 390].

A low species of somewhat the habit of the preceding; first basal leaves rounded, crenate, often cordate at the base, the others, as well as the lower stem-leaves, lyrately lobed, crenate; head turbinate, slightly bracteolate; bracts narrowly linear; rays about 1 cm. long. *S. resedifolius* has been regarded as a strictly arctic plant, but the following specimens can not be distinguished from those from Alaska and the arctic coast. It grows in Montana, at an altitude of 2000–3000 m.

MONTANA: Upper Marias Pass and McDonald's Peak, 1883, *Canby, 204.*

Senecio eremophilus Richardson, Frankl. Journ. Ed. 2, App. 31 [Syn. Fl. 1²: 393].

In shady damp places, up to an altitude of 2000 m.

MONTANA: Little Rocky Mts., 1889, *V. Havard.*

* Senecio glauciifolius.

Tall and slender, 5–6 dm. high, glabrate or slightly tomentose when young; basal leaves elliptic, coarsely sinuate-lobed, generally with smaller lobes on the petiole, which is somewhat enlarged and clasping at the base; stem-leaves ovate or rounded-ovate, sessile or half-clasping, deeply cleft into oblong divergent lobes; heads in a more or less compound corymb, about 1 cm. high; involucral bracts very narrowly linear, almost subulate; rays very narrow, light yellow; achenes brown, striate, scarcely half as long as the white pappus.

Evidently nearest related to *S. eremophilus* and *S. Clarkianus*, but has much less divided leaves, the lower of which resemble most those of *S. Balsamitae*, but the upper are much broader. From all these it differs in the very narrow bracts.

MONTANA: Columbia Falls, *Mrs. J. J. Kennedy, 36.*

* **Senecio vulgaris** L. Sp. Pl. 867 [Ill. Fl. **3**: 482].

An introduced annual with pinnatifid leaves, small many-bracteolate heads, and narrowly linear black-tipped bracts. The specimens seen from Montana resemble those from California and differ from the common European and Eastern form in being simple and having narrower leaves.

MONTANA: Willow Creek, Gallatin Co., 1883, *Scribner, 123c.*

* **Carduus arvensis** (L.) Robs. Brit. Fl. 163 [Ill. Fl. **3**: 489]; *Serratula arvensis* L. Sp. Pl. 820; *Cnicus arvensis* Hoffm. Deutschl. Fl. Ed. 2, **1**^{2}: 130 [Syn. Fl. **1**^{2}: 398].

The so-called "Canada Thistle," an introduced species from Europe, is found occasionally on railroad banks and roadsides. It is recognized by its small heads of dark red dioecious heads and green herbage.

MONTANA: Logan, 1895, *Rydberg, 2855.*

* **Carduus Hookerianus** (Nutt.) Heller, Cat. N. Am. Pl. 7; *Cirsium Hookerianum* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 418; *Cnicus Hookerianus* Gray, Proc. Am. Acad. **10**: 46 [Syn. Fl. **1**^{2}: 399].

In habit slightly resembling *C. Parryi*, the inner bracts, however, are not fimbriate, but all narrow and somewhat arachnoid-woolly; leaves more deeply lobed and white-tomentose beneath. It grows at an altitude of about 2000 m.

MONTANA: Yogo, 1888, *R. S. Williams*, *705* (more glabrate than the type); Long Baldy, Little Belt Mts., 1896, *Flodman*, *880*.

* Carduus Tweedyi.

Stout, 3–5 dm. high, in age glabrous, except the arachnoid-villous involucre; leaves linear, not decurrent, glaucous, pinnatifid with rounded ovate lobes ending in short yellow spines; heads about 3 cm. high and 2.5 cm. in diameter, leafy-bracteate; bracts imbricated, lanceolate, ending in a yellowish spine, 5–8 mm. long, the outer arachnoid-villous, especially on the margin, the inner puberulent; corollas rose-color; pappus tawny, plumose.

Nearest related to *C. Hookerianus* and *C. scopulorum*. From the former it differs in the glaucous leaves, which are not at all tomentose beneath, and from the latter in the more nearly round and less spiny lobes, the lack of the decurrent ridges or wings on the stem, and the smaller heads. It grows at an altitude of 2700–3000 m.

MONTANA: Park Co., 1887, *Tweedy*, *350* (type); Torn Miner Creek, 1886, *1127* (?).

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy*, *759*.

* Carduus Kelseyi.

Stem tall and stout, 0.5–2 m. high, striate, more or less cobwebhairy, very leafy; leaves linear, sinuately toothed and ciliate with rather weak spines, green above, more or less cottony beneath, or in age almost glabrate; heads several, in a leafy spike, 3–4 cm. high, subtended by linear-subulate bristly-ciliate and cobwebby leaves; bracts moderately unequal, lanceolate, without a glandular ridge, a few of the outermost with a weak spine, the rest unarmed but with a long slender tip; corolla cream-color; pappus plumose.

Somewhat intermediate between *C. scopulorum* and *C. Hookerianus*, having the cottony pubescence of the lower leaf surfaces of the latter, but the large heads and general habit of the former. It differs from both in the undivided leaves.

MONTANA: Main range of the Rockies, not far from Helena, 1891 and 1892, *F. D. Kelsey*

Carduus scopulorum Greene, Proc. Acad. Sci. Phila. **1892**: 362; *Cirsium eriocephalum* Gray, Proc. Acad. Sci. Phila. **1863**: 69; not Wallr.; *Cnicus eriocephalus* Gray, Proc. Am. Acad. **10**: 46 [Syn. Fl. $\mathbf{1}^2$: 399].

On mountain-sides, at an altitude of 2000–2500 m.

MONTANA: Park Co., 1887, *Tweedy*, *349;* Indian Creek, July 21, 1897, *Rydberg & Bessey*, *5216*.

* **Carduus Hallii** (Gray) Heller, Cat. N. Am. Pl. 7; *Cnicus Hallii* Gray, Proc. Am. Acad. **19**: 56 [Syn. Fl. 1^2: 399].

A glabrate species, with slender stem, and solitary pedunculate heads which are more or less leafy bracted at the base, the bracts tapering into an almost innocuous tip.

MONTANA: Gallatin Co., 1886, *Tweedy*, *1128*.

Carduus scariosus (Nutt.) Heller, Cat. N. Am. Pl. 7; *Cirsium scariosum* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 420; *Cnicus scariosus* Gray, Syn. Fl. 1^2: 402 [Man. R. M. 213].

In meadows, at an altitude of 2000–2500 m.

MONTANA: Park Co., 1887, *Tweedy 348;* Forks of the Madison, July 26, 1897, *Rydberg & Bessey*, *5217;* Madison River, 1883, *Scribner*, *124d*.

YELLOWSTONE PARK: 1884, *Tweedy*, *184;* Lone Star Geyser Basin, Aug. 7, 1897, *Rydberg & Bessey*, *5218* (a nearly acaulescent form).

* Carduus canovirens.

Stem 6–10 dm. high, grayish or yellowish green, striate, more or less woolly, very leafy; leaves about 2 dm. long, grayish green, slightly woolly on both sides or glabrate in age, the lower petioled, the upper more or less decurrent, deeply divided, the lobes cleft and toothed, tipped with moderately strong spines: heads rather numerous, terminating the branches, 2–3 cm. high; bracts imbricated, the outer much shorter than the inner, all more or less woolly on the margin, and with a broad glandular ridge and a moderately strong spine; corollas straw-color.

Belongs to the *undulatus* group, but has the habit of *C. Eatonii*. The forms of the leaves, the pubescence, and the size and form of the heads are the same in the two; but *C. canovirens* lacks the cobwebby hairiness often found on the heads of *C. Eatonii*, and has broader bracts with a very broad glandular ridge. It grows in meadows, at an altitude of 1800–2200 m.

MONTANA: Jack Creek, July 15, 1897, *Rydberg & Bessey*, *5213* (type).

UTAH: Logan, 1895, *Rydberg*.

Carduus undulatus Nutt. Gen. **2**: 130 [Ill. Fl. **3**: 486]; *Cnicus undulatus* Gray, Proc. Am. Acad. **10**: 42 [Syn. Fl. 1^2: 403; Bot. Cal. **1**: 418; Man. R. M. 214].

On plains, prairies and hills, up to an altitude of 2000 m.

MONTANA: Little Rocky Mts., 1889, *V. Havard;* Helena, 1892, *F. D. Kelsey;* Lewis and Clarke Co., *Mrs. Muth;* Bozeman, 1892, *W. T. Shaw;* Indian Creek, July 21, 1897, *Rydberg & Bessey, 5214;* Pony, July 6, *5215.*

*Carduus Flodmanii.

Stem comparatively slender, 0.5–1 m. high, somewhat angled and striate, more or less covered with a cottony pubescence; leaves more or less floccose, but green above, densely white-tomentose beneath, deeply divided into linear-oblong or lanceolate acute lobes tipped with rather weak yellowish spines; heads campanulate or sometimes nearly cylindric; bracts imbricated, the outer much shorter, ovate, the inner lanceolate, all more or less floccose on the margins, especially when young, and with a narrow glandular ridge, all but the innermost tipped with a weak erect or slightly spreading spine; corolla rose or reddish purple; achenes striate; pappus plumose.

Nearest related to *C. discolor* and *C. filipendulus.* From the former it differs in the more slender stem, the smaller heads, the deeper dissected leaves and the more cottony pubescence. From the latter it differs in the more dissected leaves and the lack of the tuberous roots. I have dedicated this species to my friend and companion during two of my summer trips, Mr. J. H. Flodman, of Luther Academy, Wahoo, Nebraska. Grows in rich meadow-land, at an altitude of 1000–1500 m.

MONTANA: East Gallatin Swamps, 1896, *Flodman, 879* (type); Madison Co., 1886, *Tweedy, 1126;* Judith Mts., 1882, *R. W. Springer;* Glendive, 1887, *J. H. Sandberg.*

NEBRASKA: Platte Valley, near Horse Creek, 1891, *Rydberg, 216.*

AMBROSIACEAE.

Iva xanthiifolia Nutt. Gen. **2**: 185 [Ill. Fl. **3**: 294; Syn. Fl. $\mathbf{1}^2$: 246; Man. R. M. 179]; *Cyclachaena xanthiifolia* Fresen. Ind. Sem. Hort. Frankf. 4.

In valleys and waste places, up to an altitude of 2000 m.

MONTANA: Helena, 1892, *F. D. Kelsey;* Fridley, Aug. 22, 1897, *Rydberg & Bessey.*

Iva axillaris Pursh, Fl. Am. Sept. 743 [Ill. Fl. **3**: 293; Syn. Fl. $\mathbf{1}^2$: 247; Bot. Cal. **1**: 343; Man. R. M. 180].

On river-banks and in bad-lands, up to an altitude of 2000 m.

MONTANA: Sand Coulee, 1885, *R. S. Williams, 265;* Beaver Head Co., 1888, *Tweedy, 215;* Great Falls, 1886, *F. W. Anderson, 227;* Missouri River, 1893, *Scribner, 102.*

Ambrosia artemisiifoia L. Sp. Pl. 988 [Ill. Fl. **3**: 295; Syn. Fl **1**^{2}: 249; Bot. Cal. **1**: 344; Man. R. M. 180].

On prairies and in waste places, up to an altitude of 1500 m.

MONTANA: Sand Coulee, 1885, *R. S. Williams, 266.*

Ambrosia psilostachya DC. Prod. **5**: 526 [Ill. Fl. **3**: 295: Syn. Fl. **1**^{2}: 250; Man. R. M. 181].

Prairies and river-valleys, up to an altitude of 1500 m.

MONTANA: Billings, 1898. *Williams & Griffith.*

Gaertneria acanthicarpa (Hook.) Britt. Mem. Torr. Bot. Club, **5**: 332 [Ill. Fl. **3**: 296]: *Ambrosia acanthicarpa* Hook. Fl. Bor. Am. **1**: 309; *Franseria Hookeriana* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 345 [Syn. Fl. **1**^{2}: 250; Bot. Cal. **1**: 345; Man. R. M. 181].

In sand-draws, up to an altitude of 1500 m.

MONTANA: Great Falls, 1891, *R. S. Williams, 860:* Billings, 1898, *Williams & Griffith.*

Xanthium Canadense Mill. Gard. Dict. Ed. 8, no. 2 [Ill. Fl. **3**: 298; Syn. Fl. **1**^{2}: 252: Man. R. M. 182].

In waste places, up to an altitude of 1500 m.

MONTANA: Big Timber, 1892, *F. D. Kelsey;* Great Falls, 1885, *F. W. Anderson, 230;* Billings, 1898, *Williams & Griffith.*

CICHORIACEAE.

Ptilocalais nutans (Geyer) Greene, Bull. Cal. Acad. **2**: 54; *Scorzonella nutans* Geyer; Hook. Lond. Journ. Bot. **6**: 253; *Microseris nutans* Sch. Bip. Pollichia, **22–24**: 308 [Bot. Cal. **1**: 423: Syn. Fl. **1**^{2}: 416; Man. R. M. 216].

In wet meadows, up to an altitude of 2500 m.

MONTANA: Elliston, 1890, *F. D. Kelsey;* Lower Sand Coulee, 1891, *R. S. Williams, 701;* Deer Lodge, 1890, *F. D. Kelsey;* Bridger Mts., June 14, 1897, *Rydberg & Bessey, 5271;* Spanish Basin, June 28, *5272.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Mammoth Hot Springs, 1885, *Tweedy, 698.*

Nothocalais cuspidata (Pursh) Greene, Bull. Cal. Acad. (II.) **2**: 55 [Ill. Fl. **3**: 278]; *Troximon cuspidatum* Pursh, Fl. Am. Sept. 742 [Syn. Fl. **1**^{2}: 437; Man. R. M. 221].

On prairies, up to an altitude of 1500 m.

MONTANA: Great Falls, 1886, *R. S. Williams, 34;* Custer Co., 1892, *Mrs. Light.*

Nothocalais troximoides (Gray) Greene, Bull. Cal. Acad. (II.) **2**: 55; *Microseris troximoides* Gray, Proc. Am. Acad. **9**: 211 [Bot. Cal. **1**: 427; Syn. Fl. **1**^{2}: 420; Man. R. M. 216].

Hills and plains, at an altitude of 1500–2500 m.

MONTANA: Virginia City, 1892, *Dr. J. D. Heald:* Bozeman, 1882, *Tweedy, 399;* Helena, 1887, *F. W. Anderson.*

* Ptiloria ramosa.

(?) *Stephanomeria runcinata* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 427; not *Prenanthes runcinata* James.

Stems several, from a woody caudex, much branched with spreading branches, striate, puberulent below, glabrate above; lower leaves lanceolate, runcinately divided, the lobes narrow, divergent and recurved, the uppermost leaves linear and entire; heads about 1 cm. long, the bracts oblong, acute: flowers generally 5, reddish purple; achenes glabrous; pappus plumose to near the base.

Has been confused with *P. pauciflora* and *P. tenuifolia*, having the habit more like the former, but more branched and with broader leaves. The pappus is, however, that of *P. tenuifolia.* The form of the heads and the color of the flowers are strikingly like those of *Lygodesmia juncea.* It grows in dry places, on magnesia hills, in badlands, etc., at an altitude of 1000–1500 m.

MONTANA: Great Falls, 1891, *R. S. Williams, 840;* Lewis and Clarke Co., *Mrs. Muth;* Indian Creek, near Helena, 1883, *Scribner, 129b;* Billings, 1898, *Williams & Griffith.*

WYOMING: Garfield Peak, *Aven Nelson, 655.*

NEBRASKA: Scott's Bluffs, 1891, *Rydberg, 219* (type).

COLORADO: Boulder, 1892, *H. N. Patterson, 281;* 1891, *E. Penard, 271.*

Ptiloria tenuifolia (Torr.) Raf. Atl. Journ. 145; *Prenanthes tenuifolia* Torr. Ann. Lyc. N. Y. **2**: 210: *Lygodesmia minor* Hook. Fl. Bor. Am. **1**: 205; *Stephanomeria minor* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 427 [Syn. Fl. **1**^{2}: 413; Bot. Cal. **1**: 428].

On dry hills and in bad-lands, up to an altitude of 2000 m.

MONTANA: Prickly Pear Cañon, 1887, *R. S. Williams, 730;* Madison Co., 1886, *Tweedy, 1125;* Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 5273;* Billings, 1898, *Williams & Griffith.*

* **Tragopogon porrifolius** L. Sp. Pl. 789 [Ill. Fl. **3**: 269; Syn. Fl. **1**^{2}: 415].

The "Salsify" or "Oyster-plant," with a clavate-thickened and fistulose peduncle and violet-purple flowers, sometimes escapes from cultivation.

MONTANA: Bozeman, 1897, *H. S. Jennings*.

Taraxacum Taraxacum (L.) Karsten, Deutsch. Fl. 1138 [Ill. Fl. **3**: 271]: *Leontodon Taraxacum* L. Sp. Pl. 798: *Taraxacum officinale* Weber: Wigg. Prim. Fl. Holsat. 56 [Syn. Fl. **1**^{2}: 440; Man. R. M. 222]: *T. Dens-leonis* Desf. Fl. Atl. **2**: 228 [Bot. Cal. **1**: 439].

Introduced around dwellings and along roadsides.

MONTANA: Bozeman, 1892, *W. T. Shaw*.

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy*, *732*.

Taraxacum latilobum DC. Prod. **7**: 146; *Taraxacum officinale alpinum* Gray, Syn. Fl. **1**^{2}: 440 [Man. R. M. 222]; not *T. alpinum* Koch; *T. officinale lividum* Gray, l. c., in part.

Taraxacum alpinum of Southern Europe and Western Asia is much smaller, and has nothing to do with our American plant. The latter is not much smaller than *T. Taraxacum*, from which it differs in the broad outer bracts which are not reflexed, and in the shorter and broader lobes of the leaves. The inner bracts are very slender, often somewhat livid and occasionally slightly corniculate at the tip. In the original description the achenes are said to be muricate all over and the leaves hirsute on the veins. In the Rocky Mountain plant the achenes are sometimes muricate only at the apex as in *T. Taraxacum*, and the leaves are glabrous. The original specimens were from Newfoundland; the Rocky Mountain plant may be distinct. *T. lividum* Koch is generally regarded as the same as *T. palustre* DC. It has very narrow leaves, and the only American specimens I have seen are from Greenland and the Arctic coast.

MONTANA: Bridger Mountains, June 15, 1897, *Rydberg & Bessey*, *5295;* Old Hollowtop, Pony, July 7, *5296;* Spanish Basin, July 28, *5297;* Sheridan, 1892, *Mrs. L. A. Fitch;* Highwood Mountains, 1888, *R. S. Williams*, *434;* Basin, 1892, *Kelsey;* Bozeman Pass, 1883, *Scribner*, *129*.

YELLOWSTONE PARK: Black Tail Deer Creek, 1885, *Tweedy*, *733*.

* Taraxacum eriophorum.

Very small. Scape 2–3 cm. high; leaves 2–3 cm. long, oblanceolate to spatulate, entire or slightly sinuately dentate, contracted into a winged petiole, their bases covered more or less on the upper surface with brown fibers; head about 1.5 cm. high; involucres somewhat livid, the outer consisting of a single row of ovate close bracts, the inner of lanceolate sometimes slightly corniculate bracts.

MONTANA: Sheridan, 1892, *Mrs. L. A. Fitch* (in the herbarium of the Montana Agricultural College, at Bozeman).

Taraxacum scopulorum (Gray); *Taraxacum officinale scopulorum* Gray, Syn. Fl. 1²: 440 [Man. R. M. 223].

On the tops of the highest mountains, at an altitude of nearly 3000 m.

MONTANA: East Boulder, 1887, *Tweedy, 303;* Old Hollowtop, Pony Mts., July 9, 1897, *Rydberg & Bessey, 5294.*

YELLOWSTONE PARK: Soda Butte Creek, 1885, *Tweedy, 731.*

Sonchus asper (L.) All. Fl. Ped. **1**: 222 [Ill. Fl. **3**: 272; Syn. Fl. **1**²: 444; Bot. Cal. **1**: 443; Man. R. M. 223]; *Sonchus oleraceus asper* L. Sp. Pl. 794.

In waste places; introduced.

MONTANA: Salesville, 1892, *W. T. Shaw.*

Lactuca pulchella (Pursh) DC. Prod. **7**: 134 [Ill. Fl. **3**: 275; Syn. Fl. **1**²: 443; Bot. Cal. **1**: 442; Man. R. M. 223]; *Sonchus pulchellus* Pursh, Fl. Am. Sept. 502.

In meadows, up to an altitude of 2500 m.

MONTANA: Helena, 1889, *F. D. Kelsey;* Belt River, 1881, *R. S. Williams, 71;* Bear Creek Cañon, 1892, *W. T. Shaw;* Pony Mts., July 8, 1897, *Rydberg & Bessey, 5274;* Madison Valley, 1871, *Hayden Survey;* 1883, *Scribner, 139a.*

YELLOWSTONE PARK: 1894, *F. H. Burglehaus, 750;* Yellowstone Lake, 1885, *Tweedy, 757.*

Lactuca Ludoviciana (Nutt.) DC. Prod. **7**: 141 [Ill. Fl. **3**: 273; Syn. Fl. **1**²: 443; Man. R. M. 223]; *Sonchus Ludovicianus* Nutt. Gen. **2**: 125.

On river-banks and in wet meadows, up to an altitude of 2000 m.

MONTANA: Tenderfoot Creek, 1890, *R. S. Williams, 842.*

* **Lygodesmia spinosa** Nutt. Trans. Am. Phil. Soc. (II.) **7**: 444 [Syn. Fl. **1**²: 436; Bot. Cal. **1**: 441].

A diffuse straggling spinescent perennial, with linear leaves, the uppermost reduced to small scales. Grows on gravelly hills and plains, up to an altitude of 2000 m.

MONTANA: *Burke;* Cinnabar, 1884, *Tweedy, 163;* Madison Co., 1886, *1124;* Townsend, 1888, *R. S. Williams, 786;* Fridley, Aug. 22, 1897, *Rydberg & Bessey, 5276.*

YELLOWSTONE PARK: Along the Yellowstone River, *Tweedy, 163,* in part.

Lygodesmia juncea (Pursh) Don, Edinb. N. Phil. Journ. **6**: 311 [Ill. Fl. **3**: 276: Syn. Fl. 1^2: 435; Bot. Cal. **1**: 441; Man. R. M. 220]; *Prenanthes juncea* Pursh, Fl. Am. Sept. 498.

On prairies and plains, at an altitude of 1000–2000 m. It sometimes becomes a troublesome weed in fields and is known under the name of "Prairie Pink."

MONTANA: Livingston, Park Co., 1887, *Tweedy, 340;* Great Falls, 1891, *R. S. Williams, 72;* Park Co., 1889, *Tweedy;* Trail Creek, 1887, *345;* Livingston, 1887, *346;* Cinnabar, 1884, *162;* Fridley, Aug. 22, 1897, *Rydberg & Bessey, 5275.*

Agoseris glauca (Pursh) Greene, Pittonia, **2**: 176 [Ill. Fl. **3**: 277]; *Troximon glaucum* Pursh, Fl. Am. Sept. 505 [Bot. Cal. **1**: 437; Syn. Fl. 1^2: 437; Man. R. M. 221].

In meadows and on rich hillsides, at an altitude of 1500–2500 m.

MONTANA: Helena, 1890 and 1891, *F. D. Kelsey;* Columbia Falls, *Mrs. Kennedy, 31;* Great Falls, 1891, *R. S. Williams, 88;* Dillon, 1895, *Rydberg, 2862;* Jack Creek Cañon, July 14, 1897, *Rydberg & Bessey, 5278;* Spanish Basin, June 24, *5277;* Belt Mountain, 1882, *Canby.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* 1884, *Tweedy, 160;* East DeLacy's Creek, Aug. 10, 1897, *Rydberg & Bessey, 5279.*

Agoseris parviflora (Nutt.) Dietr. Syn. Pl. **4**: 1332 [Ill. Fl. **3**: 278]; *Troximon parviflorum* Nutt. Trans. Am. Phil. (II.) Soc. **7**: 434; *T. glaucum parviflorum* Gray, Syn. Fl. 1^2: 437; Man. R. M. 221].

In meadows, up to an altitude of 2000 m.

MONTANA: Missoula Co., *Mrs. Kennedy.*

YELLOWSTONE PARK: 1885, *Tweedy, 700;* Yellowstone Falls, Aug. 14, 1897, *Rydberg & Bessey, 5283.*

Agoseris scorzoneraefolia (Schrad.) Greene, Pittonia, **2**: 177; *Ammogeton scorzoneraefolium* Schrad. Ind. Sem. Hort. Goett. **1833**: 1 [DC. Prod. **7**: 98]; *Troximon glaucum dasycephalum* Torr. &

Gray, Fl. N. Am. **2**: 490 [Syn. Fl. **1**^{2}: 437; Man. R. M. 221].

In meadows and on hillsides, at an altitude of 1500–2000 m.

MONTANA: Spanish Basin, 1896, *Flodman 940;* Black Hawk, *941;* Lima, 1895, *Rydberg, 2863;* Jack Creek, July 14, 1897, *Rydberg & Bessey, 5282;* Spanish Basin, June 26, *5281;* Belt Mts., 1883, *Scribner, 127;* Jocko River, 1883, *Canby, 213.*

* **Agoseris pumila** (Nutt.); *Troximon pumilum* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 434.

Like the preceding, but much lower; scape seldom exceeding 1 dm. high; leaves short and rather fleshy. It grows on the mountains, at an altitude of 2500 m. or more.

MONTANA: Little Belt Mts., 1896, *Flodman, 938* and *939;* Bridger Mountains, July 14, 1897, *Rydberg & Bessey, 5280a;* Cedar Mountain, July 16, *5285;* Bozeman, 1883, *Scribner, 128.*

Agoseris Leontodon; *Troximon glaucum laciniatum* Gray, Bot. Cal. **1**: 437 [Syn. Fl. **1**^{2}: 437; Man. R. M. 221]: not *T. laciniatum* Gray, Proc. Am. Acad. **19**: 72.

Near to *A. glauca*, and resembles a depauperate form of it, but is more tufted, and has nearly always ascending instead of erect stems, the upper part of which, as well as the involucre, are more or less pubescent. The outer bracts separate it from *A. pumila*, in which they are ovate, while they are lanceolate in this species. The leaves are nearly always more or less laciniate.

The species is rather common at an altitude of 2000 m., and extends from Montana to California and Arizona.

MONTANA: Bridger Mountains, June 14, 1897, *Rydberg & Bessey, 5280.*

* Agoseris Leontodon aspera.

Like the species, but cinereous-pubescent throughout.

On Pringle's specimens in the Columbia Herbarium is written: "*Macrorhyncus asper* Greene", but it is not in Professor Greene's handwriting, and I cannot find any description of that species.

IDAHO: Mt. Chauvet, July 29, 1897, *Rydberg & Bessey, 5286* (type).

MONTANA: Indian Creek, July 22, *Rydberg & Bessey, 5287.*

CALIFORNIA: Sierra Nevada, above Summit Valley, 1882, *C. G. Pringle.*

* Agoseris Leontodon pygmaea.

Cinereous, as in the preceding variety, but very low, only 3–6 cm. high; head small, turbinate; involucre more or less purplish, of 10–15 lanceolate bracts; corollas more or less tinged with rose; leaves narrow and often entire, linear.

Among rocks, at an altitude of 3000 m.

MONTANA: Old Hollowtop, near Pony, July 9, 1897, *Rydberg & Bessey, 5288.*

* Agoseris villosa.

Stem stout, about 2 dm. high, densely villous when young, glabrate in age; leaves very villous-pubescent, about 1 dm. long, broadly lanceolate, entire, or laciniately toothed, rather thick; heads 2–2.5 cm. high and fully as wide, hemispheric; involucre densely villous, the outer bracts ovate or oblong, the inner lanceolate; achenes, including the beak, which is not very strongly striate, about 1 cm. long, brown.

Most resembles *A. pumila*, but is easily distinguished by the pubescence.

MONTANA: Helena, 1891, *F. D. Kelsey* (in the herbarium of Columbia University; type); Basin, 1892 (in the herbarium of Montana College of Agriculture).

* Agoseris altissima.

Stem sparingly villous, 5–7 dm. high; leaves 15–25 cm. long, linear-oblanceolate, entire, sparingly beset with villous hairs, especially on the margin; head 3 cm. high and the disk 2.5 cm. in diameter; bracts densely pilose, more or less brownish in color, the outer broadly oblong, the inner lanceolate; ligules 2.5 cm. long, at first yellow, turning pinkish; achenes, as well as the short beak, glabrous, striate.

Apparently nearest related to *A. scorzoneraefolia*, but taller and rather with the habit of the other section of the genus.

A rare plant; found on a creek-bank, at an altitude of a little over 2000 m.

MONTANA: Jack Creek, July 14, 1897, *Rydberg & Bessey, 5289.*

* Agoseris carnea.

Simple, or slightly branched at the base, glabrous except the upper part of the scape and involucre; leaves oblanceolate, 7–20 cm. long, entire or rarely with a few small teeth, dark green, acute; scape seldom over 1 dm. high, rarely much exceeding the leaves, often shorter, densely villous above, especially just below the head, which is turbinate and about 15 mm. high; bracts subequal, linear or linear-lanceolate, villous below and somewhat viscid, spotted with purplish brown, the outer obtuse, the inner acute; flowers from pink to flesh-color or purplish red; achenes unknown.

Resembles somewhat a low *A. aurantiaca*, but the inner bracts are not long-acuminate and much longer than the rest, as in that species. It has been labeled *Troximon aurantiacum purpureum*, but this or *A. purpurea* is a much larger plant from Colorado with laciniate leaves, and long-acuminate inner bracts. As the achenes are unknown the plant may belong to the *glauca* section of the genus. The only rose-flowered species of that section are the preceding and *A. rosea* (Nutt.) Dietr. The latter is described as having laciniate leaves. Subalpine meadows, at an altitude of 2000–2800 m.

MONTANA: Park Co., 1887, *Tweedy, 305*.

BRITISH COLUMBIA: Mt. Queest, 1889, *J. M. Macoun* (type).

Agoseris aurantiaca (Hook.) Greene, Pittonia, 2: 177; *Troximon aurantiacum* Hook. Fl. Bor. Am. **1**: 300 [Bot. Cal. **1**: 437; Syn. Fl. **1**^{2}: 438; Man. R. M. 222].

In valleys, at an altitude of 2000–2500 m.

MONTANA: Spanish Basin, 1896, *Flodman, 936* and *937;* Head of the Stillwater, 1897, *P. Koch, 69;* Lake Plateau, *55;* Jack Creek Cañon, July 14, 1897, *Rydberg & Bessey, 5292;* Bozeman, 1883, *Canby, 214*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall;* Swan Lake, 1885, *Tweedy, 699*.

Agoseris gracilens (Gray) Greene, Pittonia, 2: 177; *Troximon gracilens* Gray, Proc. Am. Acad. **19**: 71 [Syn. Fl. **1**^{2}: 438; Man. R. M. 222].

In valleys, at an altitude of 2000–2500 m.

MONTANA: Park Co., 1887, *F. Tweedy, 304* (flowers purple) (?); Silver Bow Co., *Mrs. Jennie Moore;* Tiger Butte, 1886, *R. S. Williams, 429;* Bozeman, 1895, *Rydberg, 2860;* Pony Mountains, July 7, 1897, *Rydberg & Bessey, 5290*.

YELLOWSTONE PARK: 1883, *Miss Mary Compton*.

***Agoseris Greenei** (Gray); *Troximon gracilens Greenei* Gray, Proc. Am. Acad. **19**: 71 [Syn. Fl. **1**^{2}: 438].

Like the last, but with very narrow erect leaves, which are entire or with a few linear lobes; peduncle and involucre nearly destitute of wool.

MONTANA: Yogo, 1888, *R. S. Williams, 429a*.

YELLOWSTONE PARK: Lake, Aug. 12, 1897, *Rydberg & Bessey, 5291.*

* **Agoseris elata** (Nutt.) Greene, Pittonia, **2**: 177; *Stylopappus elatus* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 433; *Troximon Nuttallii* Gray, Proc. Am. Acad. **9**: 216 [Bot. Cal. **1**: 438; Syn. Fl. **1**^{2}: 438].

Much larger than the two preceding; leaves broad and laciniate; head 2.5 cm. high, or more, the involucre woolly and the flowers yellow. Moist open woods, at an altitude of 1500–2000 m.

MONTANA: Cottonwood Creek, 1892, *W. T. Shaw;* Electric Peak, Aug. 20, 1897, *Rydberg & Bessey, 5293.*

Crepis nana Richards. Frankl. Journ. Ed. 2, App. 92 [Syn. Fl. **1**^{2}: 431; Man. R. M. 218].

Among loose rocks, at an altitude of 2500 m.

MONTANA: Upper Marias Pass, 1883, *Canby, 211.*

Crepis elegans Hook. Fl. Bor. Am. **1**: 297 [Syn. Fl. **1**^{2}: 431; Man. R. M. 218].

Dry plains, up to an altitude of 1500 m.

MONTANA: Belt River, 1886, *R. S. Williams, 438;* Cadot's Pass, 1883, *Canby, 212;* Birch and Depous Creek, *212,* in part.

Crepis glauca (Nutt.) Torr. & Gray, Fl. N. Am. **2**: 488 [Ill. Fl. **3**: 280; Bot. Cal. **1**: 436; Syn. Fl. **1**^{2}: 431; Man. R. M. 219]; *Crepidium glaucum* Nutt. Trans. Am. Phil. Soc. (II.) **7**: 436.

In meadows, up to an altitude of 2500 m.

MONTANA: Helena, 1887, *R. S. Williams;* Deer Lodge, 1895, *Rydberg, 2858;* Blackfoot River, 1883, *Canby, 210;* Smith River, 1883, *Scribner, 126.*

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall.*

Crepis runcinata (James) Torr. & Gray, Fl. N. Am. **2**: 487 [Ill. Fl. **3**: 280; Syn. Fl. **1**^{2}: 431; Bot. Cal. **1**: 436; Man. R. M. 219]; *Hieracium runcinatum* James in Long's Exped. **1**: 453.

In meadows, at an altitude of 1000–2500 m.

MONTANA: Big Hole River, 1888, *Tweedy, 222;* East Boulder, 1887, *Tweedy, 333;* Great Falls, 1891, *R. S. Williams, 430;* Manhattan, 1895, *Rydberg, 2857;* Spanish Basin, June 30, 1897, *Rydberg & Bessey, 5299;* Jack Creek, July 14, *5319* (a specimen with an entire linear leaf).

YELLOWSTONE PARK: 1884, *Tweedy, 154;* Lone Star Geyser Basin, Aug. 7, 1897, *Rydberg & Bessey, 5298.*

* **Crepis runcinata alpicola** Rydberg, Bull. Torr. Bot. Club, **24**: 299.

Stem scapose, 1 dm. high, generally monocephalous; leaves entire with short petioles.

Alpine swamps, at an altitude of 2200 m.

MONTANA: Yogo, 1896, *Flodman*, *921*.

* **Crepis runcinata hispidulosa** Howell.

Upper portion of the stem and involucre hispid glandular-pubescent.

MONTANA: Park Co., 1889, *Tweedy*.

OREGON: Base of Stein's Mountain, 1885, *T. Howell* (type, in the Herbarium of Columbia University).

Crepis acuminata Nutt. Trans. Am. Phil. Soc. (II.) **7**: 437 [Bot. Cal. **1**: 436; Syn. Fl. **1**^{2}: 431; Man. R. M. 219].

Dry hills, at an altitude of 1500–2000 m.

MONTANA: Trail Creek, Park Co., 1887, *Tweedy*, *332;* Bozeman, *331;* Madison Co., *Mrs. Flora McNulty;* Helena, 1894, *E. Douglas;* Great Falls, 1891, *R. S. Williams*, *74;* Spanish Basin, 1896, *Flodman*, *923;* Bozeman, 1895, *Rydberg*, *2856;* Spanish Basin, June 24, 1897, *Rydberg & Bessey*, *5301;* Old Hollowtop, Pony Mts., July 6, *5302;* Indian Creek, July 21, *5300;* Jefferson City, 1883, *Scribner*, *126a*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall.*

Crepis intermedia Gray, Syn. Fl. **1**^{2}: 432 [Ill. Fl. **3**: 282; Man. R. M. 219].

On hillsides, at an altitude of 1500–2500 m.

MONTANA: Cinnabar, 1887, *Tweedy*, *332;* Spanish Basin, 1896, *Flodman*, *922;* Jack Creek Cañon, July 14, 1897, *Rydberg & Bessey*, *5303*.

Crepis gracilis (D. C. Eaton); *Crepis occidentalis gracilis* D. C. Eaton, King's Exped. **5**: 203; *C. intermedia gracilis* Gray, Syn. Fl. **1**^{2}: 432 [Man. R. M. 219].

This and the preceding are very closely related and perhaps only forms of one species. If so regarded the species should take the name *gracilis*, as that is the older, and *C. intermedia* should be regarded as the variety. Grows on hillsides, at an altitude of 2000–2500 m.

MONTANA: Helena, 1891, *F. D. Kelsey;* Jack Creek Cañon, July 14, 1897, *Rydberg & Bessey*, *5304;* McDonald's Peak, 1883, *Canby*, *209*.

* **Crepis atribarba** † Heller, Bull. Torr. Bot. Club, **26**: 314.

Resembles most *C. intermedia* and *C. barbigera*, but differs from both in the more tapering achenes, and from the first also in the presence of hairs or barbs on the involucre. In *C. atribarba* the barbs are black, very slender, and scattered all along the midrib of the bracts, while in *C. barbigera* they are stouter, greenish yellow, and crowded at the end of the bracts. It grows at an altitude of 1000–2000 m.

MONTANA: Spanish Basin, June 28, 1897, *Rydberg & Bessey*, *5308*.

* Crepis pumila.

Rather low and stout, generally with two stems or more from the same root, 1.5–2 dm. high, grayish villous-pubescent, leafy; leaves broadly lanceolate, laciniate-pinnatifid with lanceolate-triangular lobes, acuminate, 8–10 cm. long; basal leaves with a winged petiole, the stem-leaves sessile; corymbs narrow, with short erect branches; heads about 12 mm. high and 5–8 mm. broad; principal bracts about 10, linear or linear-lanceolate, grayish villous-puberulent, without glandular hairs or barbels; achenes cylindric, not at all tapering upwards, very sharply angled.

In habit it most resembles *C. occidentalis*, but lacks the black hairs on the involucre characteristic of that species; the heads are also much smaller and the achenes different. From *C. intermedia* it differs in the low habit, and in the form of the achenes, which in the latter taper upward.

On dry hillsides, at an altitude of 1500–2500 m.

MONTANA: Somewhere between Fort Benton and Walla Walla, *John Pearsall* (Lt. Mullan's Expedition), *917*; Bridger Mountains, June 14, 1897, *Rydberg & Bessey*, *5305* (type).

IDAHO: Beaver Cañon, 1895, *Rydberg*.

WYOMING: Cement Creek, 1897, *Tweedy*, *612*.

Crepis occidentalis Nutt. Journ. Acad. Sci. Phila. **7**: 29 [Ill. Fl. **3**: 282; Syn. Fl. $\mathbf{1}^2$: 432; Bot. Cal. **1**: 435].

Valleys and hillsides, at an altitude of 1000–2500 m.

MONTANA: Great Falls, 1885, *R. S. Williams*; Spanish Basin, June 24, 1897, *Rydberg & Bessey*, *5307*; Bridger Mountains, June 14, *5306*.

* **Crepis scopulorum** Coville, Contr. U. S. Nat. Herb. **3**: 563.

Differs from *C. occidentalis* in the numerous and narrow segments of the leaves, in the hairs of the involucre, which are not glandular, and in the achenes which are not costate at maturity.

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† In the original publication the name is spelled *atrabarba*, which is bad Latin. In Latin the binding vowel is *i*, or occasionally, for euphony, *o*.

MONTANA: Beaver Head Co., 1888, *Tweedy, 221;* Deer Lodge, 1888, *F. W. Traphagen;* Helena, 1887, *F. W. Anderson;* Jefferson River, 1883, *Scribner, 126b.*

YELLOWSTONE PARK: Mammoth Hot Springs, 1885, *Tweedy, 737;* 1893, *J. N. Rose, 680* (type).

Nabalus sagittata (Gray); *Prenanthes alata sagittata* Gray, Syn. Fl. 1²: 435 [Man. R. M. 220].

In woods, in the western part of the State.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 937;* Jocko Cañon, *Watson;* Flathead River, 1883, *Canby, 206.*

Hieracium Canadense Michx. Fl. Bor. Am. **2**: 86 [Ill. Fl. **3**: 286; Syn. Fl. 1²: 425; Man. R. M. 216].

On wooded hillsides, up to an altitude of 2000 m.

MONTANA: West Boulder, 1887, *Tweedy, 330;* Columbia Falls, *Mrs. Kennedy, 5* and *12;* Little Belt Mts., 1896, *Flodman, 924;* Birdtail Creek, 1883, *Scribner, 125.*

Hieracium umbellatum L. Sp. Pl. 804 [Ill. Fl. **3**: 286; Syn. Fl. 1²: 425; Man. R. M. 217].

On wooded hillsides, up to an altitude of 2500 m.

MONTANA: Helena, 1890, *F. D. Kelsey;* Jefferson Co., 1890, *Kelsey;* Belt River Cañon, 1886, *F. W. Anderson, 265.*

Hieracium gracile Hook. Fl. Bor. Am. **1**: 298 [Syn. Fl. 1²: 427; Man. R. M. 217]; *Hieracium triste gracile* Gray, Bot. Cal. **1**: 441.

Damp places in woods and on mountain-tops, at an altitude of 2000–3000 m.

MONTANA: Park Co., 1887, *Tweedy, 329;* Granite, 1892, *F. D. Kelsey;* Belt Park, 1886, *R. S. Williams, 437;* Spanish Basin, 1896, *Flodman, 932* and *933;* Little Belt Mts., *934* and *935;* Lake Plateau, 1897, *P. Koch, 58;* Old Hollowtop, July 7, 1897, *Rydberg & Bessey, 5313;* Spanish Basin, June 28, *5318;* McDonald's Peak, 1883, *Canby, 207.*

YELLOWSTONE PARK: 1884, *Tweedy, 182.*

* **Hieracium gracile minimum** Aven Nelson, Bull. Wyo. Exp. Sta. **28**: 144.

"Radical leaves 3–6, stem single, bearing 1–4 heads." The plant is in every respect much smaller.

MONTANA: Old Hollowtop, Pony, July 7, 1897, *Rydberg & Bessey, 5314*.

Hieracium albiflorum Hook. Fl. Bor. Am. **1**: 298 [Bot. Cal. **1**: 441; Syn. Fl. **1**^{2}: 428; Man. R. M. 217].

In woods, at an altitude of 1500–2500 m.

MONTANA: North Sun River, 1887, *R. S. Williams, 67;* Columbia Falls, *Mrs. Kennedy, 14;* Gallatin Co., 1886, *Tweedy, 1131;* Spanish Basin, 1896, *Flodman, 926* and *928;* Bridger Mts., *927;* Spanish Basin, June 28, 1897, *Rydberg & Bessey, 5315*.

YELLOWSTONE PARK: 1885, *Tweedy, 739;* Lower Geyser Basin, Aug. 4, 1897, *Rydberg & Bessey, 5316;* Upper Basin, Aug. 8, *5317*.

Hieracium cynoglossoides Arvet-Touvet, Spicil. Hier. 20 [Syn. Fl. **1**^{2}: 429; Man. R. M. 218].

In woods, at an altitude of 1500–2500 m.

MONTANA: Sweet Grass Cañon, 1896, *Flodman, 930;* Little Belt Mts., *931*.

YELLOWSTONE PARK: Upper Geyser Basin, Aug. 8, 1897, *Rydberg & Bessey, 5312*.

Hieracium griseum.

Hieracium Scouleri Torr. & Gray, Fl. N. Am. **2**: 478, mainly [Syn. Fl. **1**^{2}: 427, in part; Man. R. M. 217]; not Hook.

Stem 6–10 dm. high, covered with long white or yellowish hairs from evident papillae; leaves linear-oblanceolate or oblong-linear, densely beset with long white hairs: panicle narrow, more or less hairy; heads about 1 cm. high; bracts linear-lanceolate, moderately imbricated, glandular, dark, and, at least when young, beset with long hairs; achenes dark brown, glabrous, striate; pappus yellowish or dirty white.

Two specimens from Scouler's collection, constituting without any doubt a part of the material from which *H. Scouleri* Hook. was described, are in the Torrey herbarium, and these belong to a species very distinct from what has generally gone under that name. Scouler's plant has short obovate or spatulate rather numerous basal leaves, rather few stem-leaves, longer brownish hairs, more open panicle, and smaller heads which are 8 mm. long. It is apparently the same as *H. reclinum* Fries, Epicr. Hier. 153. Fries, following Torrey and Gray, adopted the name *H. Scouleri* for *H. griseum*. *H. Vancouverianum* mentioned by Gray on page 428, and included in *H. albiflorum*, belongs probably to *H. Scouleri* proper, at least as it is represented in the Torrey herbarium. *H. griseum* is much nearer related to *H. cynoglossoides*, and apparently grades into it. Grows on dry hills, at an altitude of 2000–2500 m.

Montana: Jack Creek, July 14, 1897, *Rydberg & Bessey, 5311;* Electric Peak, Aug. 20, *5310;* Columbia Falls, *Mrs. Kennedy, 35;* Mill Creek, 1887, *Tweedy, 328;* Bear Creek Cañon, 1892, *W. T. Shaw;* Belt Mountains, 1886, *F. W. Anderson, 266;* Gallatin Co., 1886, *Tweedy, 1130;* Sand Coulee, 1891, *R. S. Williams, 247.*

Yellowstone Park: 1884, *Tweedy, 183.*

Idaho: Henry's Lake, July 31, 1897, *Rydberg & Bessey, 5309.*

ADDITIONS AND CORRECTIONS.

On page 1, before **Botrychium Coulteri,** insert:

Botrychium Lunaria L. Sp. Pl. 1064 [Ill. Fl. **1**: 3; Man. R. M. 438].

In wet places, up to an altitude of 2000 m.

MONTANA: St. Mary's Lake, 1897, *R. S. Williams.*

On page 4, before **Asplenium Filix-foemina**, insert:

* **Phegopteris alpestris** (Hoppe) Mett. Fil. Hort. Lip. 83 [Bot. Cal. **2**: 345]; *Aspidium alpestre* Hoppe, Taschenb., 1805, according to Sw. Syn. Fil. 421.

A species much larger than *P. Dryopteris*, with oblong-lanceolate fronds with bipinnatifid pinnae. Among rocks, at an altitude of about 2000 m.

MONTANA: Head of MacDonald's Lake, 1895, *R. S. Williams, 1061.*

Asplenium Trichomanes L. Sp. Pl. 1080 [Ill. Fl. **1**: 24; Man. R. M. 442].

On rocks, up to an altitude of perhaps 2000 m.

MONTANA: Columbia Falls, 1894, *R. S. Williams, 1045.*

Before **Cheilanthes Feéi,** insert:

* **Cheilanthes gracillima** DC. Eaton, Bot. Mex. Bound. Survey, 234 [Bot. Cal. **2**: 337].

Like *C. Feéi*, but more slender, less woolly beneath, and with a lighter color; indusia yellowish brown, forming a continuous recurved margin; pinnules oblong-oval, 1.5–2 mm. long. In rocky places.

MONTANA: McDonald's Lake, 1895, *R. S. Williams, 1060.*

Instead of * **Pellaea pumila** read:

* **Pellaea occidentalis** (A. Nelson); *Pellaea atropurpurea occidentalis* A. Nelson, Fern Bulletin, **7**: 30.

Prof. Aven Nelson published the same plant under a different name while this memoir was in press; hence the change.

On page 5, before **Pteris aquilina**, insert the following three species:

Pellaea atropurpurea (L.) Link, Fil. Hort. Ber. 59 [Ill. Fl. **1**: 29; Man. R. M. 441]; *Pteris atropurpurea* L. Sp. Pl. 1076.

In rocky places, up to an altitude of 1000 m.

MONTANA: Tenderfoot Creek, Belt Cañon, 1885, *R. S. Williams, 241*, in part.

Pellaea densa (Brack.) Hook. Sp. Fil. **2**: 150 [Ill. Fl. **1**: 30; Man. R. M. 441; Bot. Cal. **2**: 340]; *Onychium densum* Brack. Fil. U. S. Expl. Exped. 120.

On rocks, up to an altitude of 2000 m.

MONTANA: McDonald's Lake, 1895, *R. S. Williams, 1059.*

Pellaea Stelleri (S. G. Gmel.) Watt, Can. Fil. no. 2 [Ill. Fl. **1**: 29]; *Pteris Stelleri* S. G. Gmel. Nov. Com. Acad. Petrop. **12**: 519; *Pellaea gracilis* Hook. Sp. Fil. **2**: 138 [Man. R. M. 441].

On rocks, up to an altitude of 2000 m.

MONTANA: Camass Lake, 1895, *R. S. Williams, 1058.*

After **Pteris aquilina** add:

* **Pteris aquilina lanuginosa** Bong. Veg. Sitch. 176 [Bot. Cal. 341].

Lower surface of the frond decidedly pubescent and the fronds generally pinnate instead of ternate.

YELLOWSTONE PARK: Gibbon River, 1888, *R. S. Williams.*

On page 8, after LYCOPODIACEAE, insert:

* **Lycopodium Selago** L. Sp. Pl. 1102 [Ill. Fl. **1**: 40].

A low species with all the leaves alike and the sporangia borne in the axils of those a little above the middle of the stem. In moist places among rocks.

MONTANA: Lake Terry, 1895, *R. S. Williams, 1062.*

* **Lycopodium obscurum** L. Sp. Pl. 1102 [Ill. Fl. **1**: 41]; *Lycopodium dendroideum* Michx. Fl. Bor. Am. **2**: 282.

A bushy and erect species with the sporangia in sessile spikes; leaves of the fertile stems scale-like and unlike those of the sterile. In moist woods, up to an altitude of 2000 m.

MONTANA: McDonald's Lake, 1892, *R. S. Williams, 926.*

* **Lycopodium complanatum** L. Sp. Pl. 1104 [Ill. Fl. **1**: 43].

A divaricately branched species with mostly 4 spikes on a long peduncle, flattened stems, and 4-ranked leaves, of which those of the lateral rows are broader and spreading. In woods, up to an altitude of 2000 m.

MONTANA: McDonald's Lake, 1892, *R. S. Williams, 925.*

Before PINACEAE insert:

TAXACEAE.

* **Taxus brevifolia** Nutt. Sylva **3**: 86 [Bot. Cal. **2**: 110].

A tree with leaves somewhat resembling those of the red fir, but the fertile cones represented by a single ovule surrounded at the base by an annular disk, which finally becomes fleshy and berry-like. It is only found west of the Rocky Mountains.

MONTANA: Columbia Falls, 1892, *R. S. Williams, 964.*

Before **Pinus flexilis** insert:

* **Pinus monticola** Dougl.; Lamb. Pin. **3**: *pl.* [Bot. Cal. **2**: 123].

A tree 20–25 m. high, somewhat related to the White Pine of the East, with slender yellowish brown cones 1.5–2.5 dm. long: leaves in fives, 5–10 cm. long.

MONTANA: Columbia Falls, *R. S. Williams.*

On page 10, instead of **Picea pungens**, read:

Picea Parryana (André) Sargent, Silva, **12**: 47: *Abies Menziesii Parryana* André, Ill. Hort. **23**: 198; *Picea pungens* Engelm. etc.

On page 15, under **Potamogeton natans**, add the following locality:

MONTANA: Whitefish Lake, 1892, *R. S. Williams.*

On page 18, after **Ruppia pectinata**, insert:

* **Naias Guadalupensis** (Spreng.) Morong, Mem. Torr. Bot. Club, **3**^{2}: 60 [Ill. Fl. **1**: 81]; *Caulinia Guadalupensis* Spreng. Syst. **1**: 20.

A plant somewhat resembling *Zannichellia* but with minutely denticulate leaves and solitary ovaries in their axils. It has often been confused with *Naias flexilis*, from which it differs in the strongly reticulated seeds. The Montana specimens, as well as those from Nebraska, differ from the more southern ones in the shorter and more crisped leaves. In ponds, at low altitudes.

MONTANA: Sand Coulee, 1891, *R. S. Williams, 858.*

On page 20, before * **Panicum pubescens**, insert:

Chaetochloa viridis (L.) Scribner, Bull. U. S. Dept. Agric. Div. Agrost. **1**: 39; *Panicum viride* L. Sp. Pl. Ed. 2, 83; *Setaria* *viridis* Beauv. Agrost. 51 [Man. R. M. 404]; *Ixophorus viridis* Nash, Bull. Torr. Bot. Club, **22**: 423 [Ill. Fl. **1**: 126].

In waste places and cultivated fields.

Montana: Great Falls, 1891, *R. S. Williams.*

* **Syntherisma humifusum** (Pers.); *S. lineare* (Krock.) Nash, Bull. Torr. Bot. Club, **22**: 420, 1895 [Ill. Fl. **1**: 111]; not *Panicum lineare* L., 1762; *Digitaria humifusa* Pers. Syn. **1**: 85, 1805; *Syntherisma glabrum* Schrad. Fl. Germ. **1**: 163, 1806; *Panicum glabrum* Gaud. Agrost. **1**: 22 [Bot. Cal. **2**: 258].

Like *S. sanguinalis* (L.) Nash (*Panicum sanguinale* L.), but the spikelets smaller, 2 mm. long: second glume about as long and the first glume generally wanting. In cultivated ground and waste places: introduced.

Montana: Great Falls, 1891, *R. S. Williams.*

On page 27, before **Alopecurus occidentalis**, insert:

* **Alopecurus Californicus** Vasey, Bull. Torr. Bot. Club, **15**: 13.

Like *A. geniculatus*, but with a thicker spike.

Montana: Lower Sand Coulee, 1888, *R. S. Williams, 820*, in part (the specimens were named by Dr. Vasey himself).

On page 39, before **Avena Americana**, insert:

* **Avena fatua** L. Sp. Pl. 80 [Bot. Cal. **2**: 295].

The Wild Oats is beginning to become a troublesome weed in many places. It differs from the common Oats in its longer panicle and densely hairy grain.

Montana: Manhattan, 1895, *Rydberg; Shear;* Bozeman, 1895 and 1896, *Rydberg.*

On page 45, before **Poa compressa**, insert:

* **Dactylis glomerata** L. Sp. Pl. 71 [Ill. Fl. **1**: 200; Bot. Cal. **2**: 301].

The Orchard Grass, an introduced species, is found occasionally around dwellings. The grass resembles somewhat a stout *Poa*, but the glumes are not scarious-margined and the spikelets are clustered in a contracted panicle.

Montana: Great Falls, 1892, *R. S. Williams.*

On page 64, second and third lines, instead of "*Trisetum caninum Gmelini*," read "*Triticum caninum Gmelini.*"

On page 66, instead of **Sitanion elymoides**, insert the following four species:

Sitanion rigidum J. G. Smith, Bull. U. S. Dept. Agric. Div. Agrost. **18**: 13.[†]

A low alpine plant. The following specimen was collected on or near the boundary of the Yellowstone Park.

YELLOWSTONE PARK: 1893, *J. N. Rose, 271.*

Sitanion strigosum J. G. Smith, Bull. U. S. Dept. Agric. Div. Agrost. **18**: 17.

In valleys, at an altitude of about 1500 m.

MONTANA: Sheep Creek, 1896, *Rydberg, 3298* (type).

Sitanion lanceolatum J. G. Smith, Bull. U. S. Dept. Agric. Div. Agrost. **18**: 20.

On dry mountain ridges, at an altitude of about 2500 m.

MONTANA: Barker, 1896, *Rydberg, 3381* (type).

Sitanion montanum J. G. Smith, Bull. U. S. Dept. Agric. Div. Agrost. **18**: 16.

In valleys, at an altitude of about 2000 m.

MONTANA: Indian Creek, 1883, *Scribner, 437;* Spanish Basin, 1896, *Rydberg, 3091* (type) and *3133; T. A. Williams, 2002.*

On page 70, before **Scirpus Americanus**, insert:

Scirpus caespitosus L. Sp. Pl. 48 [Ill. Fl. **1**: 262; Man. R. M. 366].

[†] Soon after the part of this catalogue that contained the grasses was printed a monograph of the Genus *Sitanion* containing twenty-three species, was published by Mr. J. G. Smith; of these four are found within the range, and to none of them belongs the name *Sitanion elymoides.* As I have not had the time nor the facilities to reëxamine in the new light the other specimens cited under that species in the body of the text, I cite here only the specimens mentioned by Mr. Smith. I also insert an abstract of his key:

Some of the empty glumes 2-nerved, bifid from about the middle, the lobes abruptly divergent; lowest floret of one or both spikelets sterile and like the empty glumes, but inserted on the rachilla and falling away with it.

Sheaths and dorsal surface of leaves glabrous; glaucous; low alpine plants. *S. rigidum.*

Leaves dorsally pubescent or scabrous.

Culm-leaves 1–2.5 dm. long, flexuous; flowering glumes scabrous. *S. strigosum.*

Culm-leaves short, rigid, ascending, 5–10 cm. long; flowering glumes smooth below, scabrous above. *S. montanum.*

Empty glumes lanceolate, 2–5-nerved, entire or lobed; lowest floret hermaphrodite; leaves involute, more prominently nerved above than on the back, 2–3 mm. wide. *S. lanceolatum.*

Wet meadows, at an altitude of about 1000 m.

MONTANA: Tea-kettle meadow, near Great Falls, 1894, *R. S. Williams, 962.*

Before **Eleocharis rostellata**, insert:

* **Eleocharis tenuis** (Willd.) Schultes, Mant. **2**: 92 [Ill. Fl. **1**: 255]; *Scirpus tenuis* Willd. Enum. **1**: 76.

A slender species with horizontal rootstock, 3-cleft style, 3-angled papillose achenes, and obtuse bracts. In wet meadows, at low altitudes.

MONTANA: Columbia Falls, 1893, *R. S. Williams.*

On page 71, before **Eriophorum polystachyum** L., insert:

* **Eriophorum vaginatum** L. Sp. Pl. 52 [Ill. Fl. **1**: 272].

Like *E. russeolum*, but with pure white bristles and obovate obtuse achenes. Swamps, at low altitudes.

MONTANA: North of Tea-kettle Mountain, 1892, *R. S. Williams.*

On page 84 before **Carex foenea**, insert:

Carex festucacea Willd. Sp. Pl. **4**: 242 [Ill. Fl. **1**: 359]; *Carex straminea brevior* Dewey, Am. Jour. Sci. **11**: 158: *C. straminea* Bailey: Coult. Man. R. M. 257, in part.

Nearly related to *C. straminea*, but differing in the broad almost orbicular perigynia. In dry meadows, up to an altitude of 1000 m.

MONTANA: Great Falls, 1886, *R. S. Williams, 458*, in part.

On page 89, before **Juncus bufonius**, insert:

Juncus triglumis L. Sp. Pl. 328 [Ill. Fl. **1**: 23; Man. R. M. 357].

In wet places in the mountains, at an altitude of 1000–2500 m.

MONTANA: East of Divide Mountain and Cut-bank Creek, 1897, *R. S. Williams, 1096.*

Juncus castaneus Smith, Fl. Brit. **1**: 383 [Ill. Fl. **1**: 389; Man. R. M. 357].

Around springs in the mountain regions.

MONTANA: North Fork of Cut-bank Creek, 1897, *R. S. Williams, 1097.*

On page 92, before **Juncoides campestre**, insert:

* **Juncoides glabratum** (Hoppe) Sheld. Minn. Bot. Stud. **1**: 63; *Juncus glabratus* Hoppe; Rostk. Mon. Junc. 27.

Like *J. parviflorum*, but the flowers larger, 3–3.5 mm. long, and with the style equalling the ovary.

Montana: Columbia Falls, 1892, *R. S. Williams*; 1894, *912*; Stanton Lake, 1894, *Williams*.

On page 102, before IRIDACEAE, insert:

***Trillium ovatum** Pursh, Fl. Am. Sept. 245 [Bot. Cal. **2**: 181].

This species is characterized by its purplish or dark rose-colored acute petals, narrow sepals, and very slender peduncles.

Montana: Columbia Falls, 1893, *R. S. Williams*.

Among the specimens cited under **Sisyrinchium angustifolium**, omit West Gallatin River, 1883, *Scribner*, *271*, and add after the same:

* **Sisyrinchium occidentale** Bicknell, Bull. Torr. Bot. Club, **26**: 448.

Differs from *S. angustifolium* in the much less elongated outer bract and larger interior scales, more narrowly winged stem, constricted below the frequently deflected spathes, larger flowers, and apparently smaller fewer-seeded capsules.

Montana: West Gallatin River, 1883, *Scribner*; Helena, 1888, *F. D. Kelsey*.

Yellowstone Park: 1894, *Mrs. Moore*; Mammoth Hot Springs, 1894, *F. H. Burglehaus*; 1889, *F. W. Dewart*.

On page 109, before SALICACEAE, insert:

DICOTYLEDONES.

On page 114, before **Salix stricta**, insert:

* **Salix Sitchensis** Sanson; Bong. Mem. Acad. Petersb. **2**: 162 [Bot. Cal. **2**: 87].

Somewhat like *S. stricta*, but larger, 2–4.5 m. high; aments long, with a few leafy bracts below; leaves longer and with a very fine silky tomentum beneath.

Montana: Columbia Falls, 1893, *R. S. Williams*, *972*.

On page 129, before **Polygonum Nuttallii**, insert:

Polygonum minimum Wats. King's Exped. **5**: 315 [Man. R. M. 318; Bot. Cal. **2**: 11].

In poor soil, at an altitude of about 1300 m.

Montana: Essex, 1896, *R. S. Williams*.

On page 139, before **Montia perfoliata**, insert:

* **Montia parvifolia** (Moç.) Greene, Fl. Fran. 181 [Syn. Fl. **1**^{1}: 275]; *Claytonia parvifolia* Moç.: DC. Prod. **3**: 361.

A succulent species with small ovate or lanceolate leaves borne mostly at the base; peduncles elongated, sparingly leafy, and often bearing budlike plantlets at the nodes.

MONTANA: MacDonald's Lake, 1895, *R. S. Williams.*

On page 142, before **Silene Douglasii,** insert:

* **Silene Spaldingii** Wats. Proc. Am. Acad. **10**: 344 [Syn. Fl. **1**^{1}: 221].

A viscid-tomentose plant with subspicate inflorescence, net-veined calyx, obconical in fruit, moderately stiped capsule, and short greenish white petals with broad spatulate claws and minute bifid blades.

MONTANA: Columbia Falls, 1894, *R. S. Williams.*

On page 143, before **Lychnis apetala**, insert:

Lychnis Kingii Wats. Proc. Am. Acad. **7**: 226 [Man. R. M. 33; Syn. Fl. **1**^{1}: 226].

One of the specimens of William's collection has three flowers. Alpine peaks, at an altitude of 2500–3000 m.

MONTANA: Yogo, 1888, *R. S. Williams*, *757*.

After ALSINACEAE, insert:

* **Alsine nitens** (Nutt.) Greene, Man. Bay Reg. 33; *Stellaria nitens* Nutt.; Torr. & Gray, Fl. N. Am. **1**: 185 [Syn. Fl. **1**^{1}: 233].

A slender erect annual; lower leaves ovate, acute, on slender petioles, the blades about 4 mm. long; stem-leaves lance-linear, 6–10 mm. long; sepals scarious-margined, 1–3-nerved; petals half as long as the sepals. In wet places, at an altitude of about 1000 m.

MONTANA: Columbia Falls, 1894, *R. S. Williams.*

On page 148, before **Arenaria subconjesta**, insert:

* **Arenaria serpyllifolia** L. Sp. Pl. 423 [Ill. Fl. **2**: 31; Syn. Fl. **1**^{1}: 239].

A small annual with small ovate leaves, 4–8 mm. long. Introduced in waste places.

MONTANA: Columbia Falls, 1899, *J. W. Blankinship.*

On page 152, instead of **Caltha leptosepala,** read:

Caltha rotundifolia (Huth) Greene, Pittonia, **4**: 80; *Caltha leptosepala* Coult. Man. R. M. 6; not DC.; *C. leptosepala rotundifolia* Huth, Helios, **9**: 68.

The recent publication of a paper entitled: "Segregates of Caltha leptosepala," by Professor Greene, has necessitated this change. As the following does not agree with any of the species acknowledged by him, it should be inserted before **Trollius albiflorus** :

* **Caltha uniflora.**

Almost acaulescent, bright green, 5–8 cm. high, with a single terminal flower; stipules membranous; basal leaves with petioles 1–1.5 cm. long, the blade 1.5–2 cm. long, oval, obtuse, moderately thick, indistinctly veined, subentire, cordate at the base, the basal lobes rounded, but with an open sinus, the single stem-leaf similar, but smaller, or none: sepals about 10, oblong or elliptic, bluish and distinctly veiny beneath, whitish or straw-color above, obtuse, 12–15 mm. long; stamens about equalling the pistils; filaments flattened and broadened above, 2–3 times as long as the anthers.

A delicate plant, evidently nearest related to *C. rotundifolia*, but distinguished by the single terminal flower, and the small delicate leaves with their open sinuses. In wet places near the snow, at an altitude of 3000–3300 m.

MONTANA: Haystack Peak, 1899, *Peter Koch*.

On page 155, before **Delphinium scopulorum**, insert:

* **Delphinium Ajacis** L. Sp. Pl. 351 [Ill. Fl. 2: 59; Syn. Fl. 1^1: 45].

An introduced species with a solitary pistil and finely dissected leaves. It is often confused with *D. Consolida*, from which it differs in the pubescent pod. Escaped from cultivation.

MONTANA: St. Ignatius Mission, 1899, *J. W. Blankinship*.

On page 162, before **Ranunculus hyperboreus**, insert:

* **Ranunculus limosus** Nutt.: Torr. & Gray, Fl. N. Am. 1: 20.

I think that this species is distinct from *R. Purshii*, differing not only in the dense hairiness, which is especially marked when young, but also in the smaller flowers, the small leaves, the short subulate blunt beak of achene, and in rooting more freely and producing plantlets at the nodes. In muddy places.

MONTANA: Belt River, 1888, *R. S. Williams*.

On page 164, before **Ranunculus alpeophilus**, insert:

* **Ranunculus eximius** Greene, Erythea, 3: 19.

Like *R. saxicola;* but the flowers much larger, 2 cm. broad, the very broad petals overlapping each other and forming an almost circular corolla. It grows at an altitude of about 2500 m.

MONTANA: Head of Stillwater, 1899, *Peter Koch*.

On page 168, before **Batrachium trichophyllum**, insert:

* **Batrachium aquatile** (L.) Wimm. Fl. Schles. 8: *Ranunculus aquatilis* L. Sp. Pl. 556 [Syn. Fl. 1^1: 21].

It is characterized by the presence of floating leaves, which are reniform in outline and 3–5-cleft with cuneate toothed lobes. In still water.

MONTANA: Columbia Falls, 1894, *R. S. Williams, 991.*

On page 169, before **Thalictrum venulosum**, insert:

Thalictrum sparsiflorum Turcz.; Fish. & Mey. Ind. Sem. Petrop. **1**: 40 [Man. R. M. 5; Syn. Fl. **1**^{1}: 15].

In woods in the mountain regions, at an altitude of 1000–2000 m.

MONTANA: Missoula, 1898, *Williams & Griffiths.*

On page 171, before FUMARIACEAE, insert:

PAPAVERACEAE.

Papaver nudicaule arcticum Elkan, Mon. Pap. 16 [Syn. Fl. **1**^{1}: 89]; *Papaver nudicaule* Coulter, Man. R. M. 13.

Alpine peaks, at an altitude of about 3000 m.

MONTANA: Stanton Lake, 1894, *R. S. Williams, 992.*

Before CRUCIFERAE, insert:

* **Capnoides sempervirens** (L.) Borck.: Roem. Arch. **1**^{2}: 44 [Ill. Fl. **2**: 105]: *Fumaria sempervirens* L. Sp. Pl. 700; *Corydalis glauca* Pursh, Fl. Am. Sept. 463 [Syn. Fl. **1**^{1}: 97].

A tall species with glaucous foliage, pink and yellow flowers, and long slender pods. In waste places, along the railroads. Introduced from the East.

MONTANA: Nyack, 1894, *R. S. Williams.*

On page 174, before **Barbarea Americana**, insert:

* **Sisymbrium officinale** (L.) Scop. Fl. Carn. Ed. 2, **2**: 26 [Ill. Fl. **2**: 116; Syn. Fl. **1**^{1}: 137; Bot. Cal. **1**: 41].

A tall introduced weed with lyrate leaves, the lobes generally divaricate or reflexed, small yellow flowers, and slender terete siliques which taper upward and are erect and appressed to the stem. In waste places.

MONTANA: Missoula, 1899, *J. W. Blankinship.*

On page 185, after **Sophia intermedia**, insert:

* Sophia gracilis.

Very slender, 1–2 dm. high, finely puberulent, somewhat branched; leaves 1–3 cm. long, almost simply pinnatifid; lobes linear to oblong, obtuse; raceme simple, constituting about one-half the plant; flowers very small, light yellow; pedicels at first erect, later ascending, 1–2 cm. long in fruit; silique very slender, 1–1.5 cm. long, and scarcely 1 mm. wide, more or less curved, gradually tapering into the short style; seeds strictly in one row.

In barren soil, at an altitude of 2500 m.

MONTANA: Lava Peak, four miles east of Mystic Lake, 1898, *J. W. Blankinship*.

YELLOWSTONE PARK: 1888, *Dr. Chas. H. Hall* (type).

On page 193, before **Saxifraga reflexa**, insert:

* **Saxifraga Mertensiana** Bong. Mem. Acad. Petersb. (VI.) **2**: 141 [Bot. Cal. **1**: 195].

A species generally bearing bulblets, with rounded-cordate many-lobed leaves having long petioles, club-shaped filaments, and obovate obtuse short-clawed petals. Wooded banks.

MONTANA: Stanton Lake, 1894, *R. S. Williams*.

On page 195, before **Therofon heucheriforme**, insert:

* **Suksdorfia violacea** Gray, Proc. Am. Acad. **15**: 41.

The genus is related to *Therofon* and *Sullivantia*, and characterized by its campanulate hypanthium or so-called calyx, 5 narrow sepals, long-clawed marcescent spatulate petals, and 5 stamens with sub-sessile anthers. The species has reniform lobed leaves and a bulbifero-granuliferous base.

MONTANA: Columbia Falls, 1893, *R. S. Williams*.

On page 203, before **Ribes viscosissimum** Pursh, insert:

* **Ribes petiolare** Dougl. Trans. Hort. Soc. Lond. **7**: 514.

A closer study has persuaded me that *R. petiolare* should be kept distinct from *R. Hudsonianum*. The most striking difference that distinguishes it is the very long erect raceme with very short pedicels. The following specimens, at least, should be transferred from *R. Hudsonianum* to the present species:

MONTANA: Deer Lodge, 1888, *F. W. Traphagen;* Spanish Basin, 1896, *Flodman, 537;* Missoula, 1898, *Williams & Griffith*.

On page 208, before **Rubus strigosus**, insert:

* **Rubus Americanus** (Pers.) Britton, Mem. Torr. Bot. Club, **5**: 185 [Ill. Fl. **2**: 201]; *Rubus saxatilis Americanus* Pers. Syn. **2**: 52; *R. triflorus* Richards. Frankl. Journ. Ed. 2, App. 19.

A slender trailing or ascending unarmed plant, with pedately 3-foliolate, seldom 5-foliolate, sparingly pubescent leaves, erect white spatulate petals, and red-purple fruit. In woods, up to an altitude of about 1000 m.

MONTANA: Columbia Falls, 1893, *R. S. Williams*.

On page 224, before **Rosa Sayi**, insert:

Rosa blanda Ait. Hort. Kew. **2**: 202 [Ill. Fl. **2**: 229; Man. R. M. 87].

In moist rocky places, at low altitudes.

MONTANA: Columbia Falls, 1895, *R. S. Williams, 965*.

On page 226, before **Prunus corymbulosa**, insert:

* **Prunus emarginata** Walp. Rep. **2**: 9 [Bot. Cal. **1**: 167].

The specimens seen from Montana are almost glabrous, with large thin acute leaves, large flowers, and membranous bracts. They may represent a distinct species, but the plant is too little known, and the fruit is lacking. Similar specimens have also been collected in 1896, by Heller, near Lewiston, Idaho (*3103*).

MONTANA: Columbia Falls, 1894, *R. S. Williams, 1005*.

On page 227, before **Crataegus rivularis**, insert:

* **Sorbus occidentalis** (Wats.) Greene, Fl. Fran. 54; *Pyrus occidentalis* Wats. Proc. Am. Acad. **23**: 263; *P. sambucifolia* Brew. & Wats. Bot. Cal. **1**: 189; not Cham. & Schlecht.

Distinguished from *S. sambucifolia* by the smaller inflorescence and the obtuse oblong leaflets. Hillsides and mountains, at an altitude of about 2000 m.

MONTANA: Essex, 1896, *R. S. Williams, 1069*.

On page 243, to the description of **Astragalus Macounii**, after the words "oval in cross section," add "or somewhat flattened above," and also the following localities:

MONTANA: Summit of Great Northern R. R., 1894, and Columbia Falls, 1895, *R. S. Williams*.

On page 258, before MALVACEAE, insert:

* **Lathyrus bijugatus** White, Bull. Torr. Bot. Club, **21**: 457.

A species with purple flowers; leaves with two pairs of thin elliptic to obovate leaflets; tendrils none or reduced to mere bristles. In meadows, at an altitude of about 1000 m.

MONTANA: Columbia Falls, 1895, *R. S. Williams, 1052*.

After MALVACEAE, insert:

* **Malva parviflora** L. Amoen. Acad. **3**: 416 [Syn. Fl. **1**: 298].

Like *M. rotundifolia* in habit, but with small blue petals scarcely exceeding the sepals, which enlarge in fruit and become recurved-spreading. Introduced in waste places.

MONTANA: Concord, 1890, *R. S. Williams.*

On page 262, before **Viola Canadensis,** insert:

* **Viola atriplicifolia** Greene, Pittonia, **3**: 38.

Like *V. venosa*, but smaller, finely cinereous-puberulent, and the leaf-blade 1–1.5 cm. long and sinuately 3–7-toothed. Mr. Blankinship's specimens are in fruit from the cleistogamous flowers, the pedicels are erect, 1–2 cm. long, and pods about 4 mm. long each containing two large yellowish seeds.

YELLOWSTONE PARK: 1893 *Burglehaus* (according to Greene, type); Lower Falls and Upper Geyser Basin, 1899, *J. W. Blankinship.*

On page 265, before LINACEAE, insert:

* **Geranium thermale.**

Perennial or biennial; stems several, diffuse, much branched, 1–1.5 dm. long, finely pubescent; lower leaves with slender petioles, 3–4 cm. long; blade round-reniform, puberulent on the veins, 1.5–2 cm. in diameter, truncate at the base, 5-cleft to beyond the middle; lobes cuneate, the terminal 3-toothed at the apex, the lateral 2–3-toothed or entire; upper stem-leaves similar, but smaller and only 3-cleft; pedicels axillary, generally shorter than the petioles, finely pubescent; sepals 3 or, in fruit, 5 mm. long, broadly ovate, pubescent, ending in a very short bristle-tip; petals purplish rose-color, slightly exceeding the sepals: carpels puberulent and hirsute, not wrinkled, about 3 mm. long; beak 7–8 mm. long, rather long-pointed; seeds minutely pitted.

In general it is apparently nearest related to *G. Carolinianum* and *G. Bicknellii*, but much smaller, with smaller less-divided leaves, shorter bristle-tips on the sepals, and is, so far as can be judged from the specimens, a perennial or at least a biennial. It also resembles the next in the size and form of the leaves, but differs in the presence of the bristle-tips and the pitted seeds.

MONTANA: Lo-Lo Hot Springs, 1898, *Williams & Griffith.*

* **Geranium pusillum** L. Sp. Pl. Ed. 2, 957 [Ill. Fl. **2**: 343; Syn. Fl. **1**^{1}: 361].

A species resembling *G. Carolinianum* in habit, but with smaller leaves and flowers, only 5 stamens, and smooth seeds. The lobes of the leaves are cuneate, 3-toothed at the apex, and the sepals are without subulate tips. An introduced weed in waste places.

MONTANA: Flathead Mission, 1899, *J. W. Blankinship.*

In page 268, before **Rhus trilobata**, insert:

Rhus glabra L. Sp. Pl. 265 [Ill. Fl. **2**: 387: Man. R. M. 49: Syn. Fl. **1**^{1}: 384].

In dry soil, up to an altitude of 1500 m.

MONTANA: Selish, Flathead Reservation, 1899, *J. W. Blankinship.*

In the last line, instead of "6–12 dm." read: "6–12 cm."

On page 270, after **Rhamnus alnifolia**, add:

Rhamnus Purshiana DC. Prod. **2**: 25 [Syn. Fl. **1**^{1}: 408: Man. R. M. 47; Bot. Cal. **1**: 101].

Mountain-sides, up to an altitude of perhaps 1000 m.

MONTANA: Mission Mts., near Flathead Mission, 1899, *J. W. Blankinship.*

On page 278, before **Boisduvallia glabrella**, insert:

* **Chamaenerion latifolium grandiflorum** (Britt.); *Epilobium latifolium grandiflorum* Britt. Bull. Torr. Bot. Club, **11**: 36.

Leaves ovate, and the flowers much larger than in the common form.

MONTANA: Mountain above Stanton Lake, 1894, *R. S. Williams, 1011.*

On page 291, after **Cicuta maculata**, add:

* **Cicuta bulbifera** L. Sp. Pl. 255 [Ill. Fl. **2**: 536].

A very slender plant, with finely dissected leaves having narrowly linear segments, and bulblets in the axils of the upper ones; flowers few and seldom producing fruit. In swamps.

MONTANA: MacDonald's Lake, 1892, *R. S. Williams.*

On page 294, after **Pyrola picta**, add:

* **Pyrola dentata** Smith; Rees, Cyclop. no. 18.

Like *P. picta*, but with the thick narrower oblanceolate or spatulate leaves erect, almost unspotted, and only slightly reticulated: flowers smaller.

MONTANA: Missoula, 1898, *Williams & Griffith.*

On page 301, before **Vaccinium caespitosum**, insert:

Vaccinium Myrtillus L. Sp. Pl. 349 [Man. R. M. 228; Syn. Fl. **2**^{1}: 24; Bot. Cal. **1**: 451].

The plant that is known in the Rocky Mountain region as *V. Myrtillus* may be distinct from the European species. The American plant is less green and has shorter and broader less strongly serrate leaves than the European type.

MONTANA: Missoula, 1898, *Williams & Griffith.*

On page 311, before APOCYNACEAE, insert:

* **Tetragonanthus deflexus** (J. E. Smith) Kuntze, Rev. Gen. Pl. 431 [Ill. Fl. 2: 620]; *Swertia deflexa* J. E. Smith: Rees, Cyclop. No. 8; *Halenia deflexa* Griseb.; Hook. Fl. Bor. Am. 2: 67 [Syn. Fl. 2¹: 127].

A light green plant with opposite leaves, and greenish dull white or purplish, 4-spurred corolla. In wet places in open woods.

MONTANA: Columbia Falls, 1892, *R. S. Williams; Mrs. Kennedy.*

MENYANTHACEAE.

* **Menyanthes trifoliata** L. Sp. Pl. 145 [Ill. Fl. 2: 622; Bot. Cal. 1: 485; Syn. Fl. 2¹: 128].

A water plant with trifoliolate leaves, and white fimbriate bearded corolla.

MONTANA: Columbia Falls, Tea-kettle Mountain, 1894, *R. S. Williams.*

On page 312, after **Acerates viridiflora**, add:

* **Acerates viridiflora Ivesii** Britt. Mem. Torr. Bot. Club, 5: 265 [Ill. Fl. 3: 14]; *Acerates viridiflora lanceolata* A. Gray, Syn. Fl. 2¹: 99.

Leaves lanceolate or linear-lanceolate.

MONTANA: Great Falls, 1892, *R. S. Williams, 272.*

On page 317, among the specimens cited under **Phlox collina,** omit "Grafton, 1892, *R. S. Williams, 768.*"

Before **Phlox albomarginata** insert:

* **Phlox alyssifolia** Greene, Pittonia, 3: 27.

After having received better specimens of *R. S. Williams'* No. *768*, I find that they should be referred to this species instead of to my *P. collina.* The former differs from the latter in the more exserted corolla, and the glandular calyx with narrower lobes and an evident but narrow scarious line below the sinuses. It is therefore much closer related to *P. albomarginata.*

MONTANA: Grafton and Surprise Creek, 1888 and 1892, *R. S. Williams, 768.*

On page 339, before **Agastache urticifolia**, insert:

* **Marrubium vulgare** L. Sp. Pl. 583 [Ill. Fl. **3**: 84; Syn. Fl. **2**¹: 384; Bot. Cal. **1**: 605].

A white-woolly plant with ovate crenate strongly reticulate-veined leaves, and small whitish flowers in dense verticels. An introduced weed growing along roadsides and in yards.

MONTANA: Missoula, 1898, *Williams & Griffith;* Bozeman, 1899, *J. W. Blankinship.*

On page 341, before **Stachys palustris**, insert:

* **Leonurus Cardiaca** L. Sp. Pl. 584 [Ill. Fl. **3**: 93; Syn. Fl. **2**¹: 385].

A tall puberulent plant with the lower leaves palmately 3–5-cleft into lanceolate or ovate acuminate lobes; corolla pink-purple or whitish. An introduced weed growing in waste places,

MONTANA: Missoula, 1899, *J. W. Blankinship.*

After **Solanum triflorum**, add:

Solanum nigrum L. Sp. Pl. 186 [Ill. Fl. **3**: 134; Man. R. M. 268; Syn. Fl. **2**¹: 227; Bot. Cal. **1**: 538].

In waste places at low altitudes.

MONTANA: Columbia Falls, 1894, *R. S. Williams.*

On page 342, before **Pentstemon fruticosus**, insert:

* **Scrophularia occidentalis** (Rydb.) Bicknell, Bull. Torr. Bot. Club, **23**: 315; *Scrophularia nodosa occidentalis* Rydb. Contr. U. S. Nat. Herb. **3**: 517.

Differs from *S. Marylandica* in being glandular-pubescent, especially on the upper part of the stem, and in the sharp serration of the leaves; from *S. Californica* in the very broad sterile stamen; and from both in the more gibbous corolla. In valleys, at an altitude of 1500–2000 m. The specimens collected by Watson in the Bitterroot valley, and referred by him to *S. Californica*, may belong here.

MONTANA: Stanton Lake, 1894, *R. S. Williams, 1026.*

On page 352, before **Limosella aquatica**, insert:

* **Gratiola ebracteata** Benth.; DC. Prod. **10**: 595 [Syn. Fl. **2**¹: 281; Bot. Cal. **1**: 570].

Sepals foliaceous, 6–8 mm. long, and without bractlets at the base. In wet places.

MONTANA: Railway Creek, 1897, *R. S. Williams, 1087.*

On page 362, before **Adenostegia ramosa**, insert:

* **Euphrasia Americana** Wettst. Mon. 127 [Ill. Fl. **3**: 182]; *Euphrasia officinalis* Gray, Syn. Fl. **2**^{1}: 305, in part.

A small plant, usually less than 1 dm. high, somewhat hairy, but not glandular, with round-ovate serrate leaves, generally less than 1 cm. long, and small nearly white or purplish-tinged very irregular flowers.

Montana: Between Forks of Cutbank Creek, 1897, *R. S. Williams, 1089.*

On page 366, before **Rhinanthus Crista-galli**, insert:

* **Pedicularis Oederi** Vahl, Hornem. Dansk. Oek. Plantel. Ed. 2, 580.

Like *P. versicolor* Wahl., but the corolla larger, yellow: galea less arcuate, without beak or teeth at the apex. The plant is about 1 dm. high, slightly arachnoid-hairy when young, glabrous in age: leaves pinnately divided with rounded crenate lobes. The Montana specimen has slightly larger corollas than those collected by Prof. Boeck in Norway, 1869, and by J. M. Macoun on St. Mathews Island, Alaska, 1891.

On mountains, at an altitude of 3000–3300 m.

Montana: Granite Range, 1899, *Peter Koch.*

On page 367, before **Utricularia vulgaris**, insert:

* **Pinguicula vulgaris** L. Sp. Pl. 17 [Ill. Fl. **3**: 194; Syn. Fl. **2**^{1}: 317].

An acaulescent plant with blue bilabiate and straight-spurred solitary flowers on a scape, and oblong thick basal leaves with the upper surface covered with a viscid secretion. In bogs.

Montana: Between Yellow Mountain and Lower St. Mary's Lake, 1897, *R. S. Williams, 1092*, in part; Divide Mountain, 1897, *1092*, in part (the latter specimen belongs to the form *P. macroceras* Willd., with large flowers and thicker spur, and may be distinct).

On page 378, instead of **Laurentia carnosula**, read:

Porterella carnosula (Hook. & Arn.) Torr. Hayden, Rep. **1872**: 488; *Laurentia carnosula*, etc.

The American plant is quite different from the South European and African types of *Laurentia*, and it is therefore better to regard it as belonging to a different genus.

After the specimens cited under the same, add :

*** Bolelia brachyantha.**

A somewhat fleshy water-plant 2–3 dm. high, branched from the base ; leaves oblong-lanceolate, obtuse or acutish, 5–10 mm. long, thick ; flowers in a leafy-bracteate spike ; ovary in fruit about 3 cm. long ; sepals linear or oblong-linear, obtuse, about 5 mm. long ; corolla scarcely exceeding the calyx, the lip concave, 3-toothed at the apex ; stamens shorter than the sepals.

It is nearest related to *Bolelia elegans* (Dougl.) Greene [*Downingia elegans* Gray], but differs in the very short corolla and stamens and the obtuse sepals. In water.

MONTANA : Augusta, 1887, *R. S. Williams, 712.*

On page 399, before **Erigeron simplex**, insert :

Erigeron uniflorus L. Sp. Pl. 864 [Ill. Fl. **3** : 385 : Syn. Fl. **1**^{2} : 207, in part].

The following specimens belong evidently to the true *E. uniflorus*, having the black-hairy long-acuminate bracts and narrow erect rays found in the European and Alaskan specimens. High alpine.

MONTANA : Mountains near Stanton Lake, 1894, *R. S. Williams, 1017.*

On page 416, before **Adenocaulon bicolor**, insert :

*** Gnaphalium Californicum** DC. Prod. 6 : 224 ; *Gnaphalium decurrens Californicum* Gray, Bot. Cal. **1** : 341.

Like *G. decurrens*, but the leaves not whitish beneath and less hairy ; bracts pearly white, obtuse. In wet meadows, at an altitude of about 1000 m.

MONTANA : Columbia Falls, 1894, *R. S. Williams.*

On page 428, after **Artemisia frigida**, insert :

*** Artemisia Absinthium** L. Sp. Pl. 848 [Ill. Fl. **3** : 464 ; Syn. Fl. **2**^{1} : 370].

The Wormwood of Europe is sparingly introduced.

MONTANA : Missoula, 1898, *Williams & Griffith.*

On page 431, before **Artemisia tenuis**, insert :

*** Artemisia subglabra** A. Nelson, Bull. Torr. Bot. Club, **27** : 36.

Like *A. Lindleyana*, but glabrous, although more or less glandular-dotted.

YELLOWSTONE PARK : Yellowstone River, 1899, *Aven Nelson, 5743.*

* **Artemisia paucicephala** A. Nelson, Bull. Torr. Bot. Club, **27**: 35.

Somewhat resembling *A. gnaphalodes*, but more loosely silky-floccose and with few large nodding heads in simple racemes.

Yellowstone Park: Yellowstone Lake, 1899, *A. Nelson, 6344.*

On page 432, after **Artemisia cana**, add:

Petasites sagittata (Pursh) Gray; Brew. & Wats. Bot. Cal. **1**: 407 [Syn. Fl. **1**^{2}: 376; Man. R. M. 204; Ill. Fl. **3**: 470]; *Tussilago sagittata* Pursh, Fl. Am. Sept. 332.

In wet ground, up to an altitude of about 1000 m.

Montana: Columbia Falls, 1893, *R. S. Williams.*

On page 442, in the description of **Senecio atriapiculatus,** instead of the words "Taller and shorter" read "Taller and stouter."

On page 454, after **Taraxacum latilobum**, insert:

* **Taraxacum ceratophorum** DC. Prod. **7**^{1}: 146; *Taraxacum officinale glaucescens* Gray, Syn. Fl. **1**^{2}: 440, in part.

Somewhat like *T. latilobum*, especially in the form of the leaves and the calyculum, but generally much larger, fully as large as *T. Taraxacum*, but with the inner bracts conspicuously corniculate at the tips.

Montana: Highwood Creek, 1888, *R. S. Williams, 434.*

On page 455, before **Lactuca pulchella**, insert:

* **Lactuca Scariola** L. Sp. Pl. Ed. 2, 1119 [Ill. Fl. **3**: 273; Syn. Fl. **1**^{2}: 442].

An introduced weed with spinulose-dentate leaves and small heads.

Montana: Missoula, 1899, *J. W. Blankinship.*

Before **Lygodesmia spinosa**, insert:

* **Lactuca multifida.**

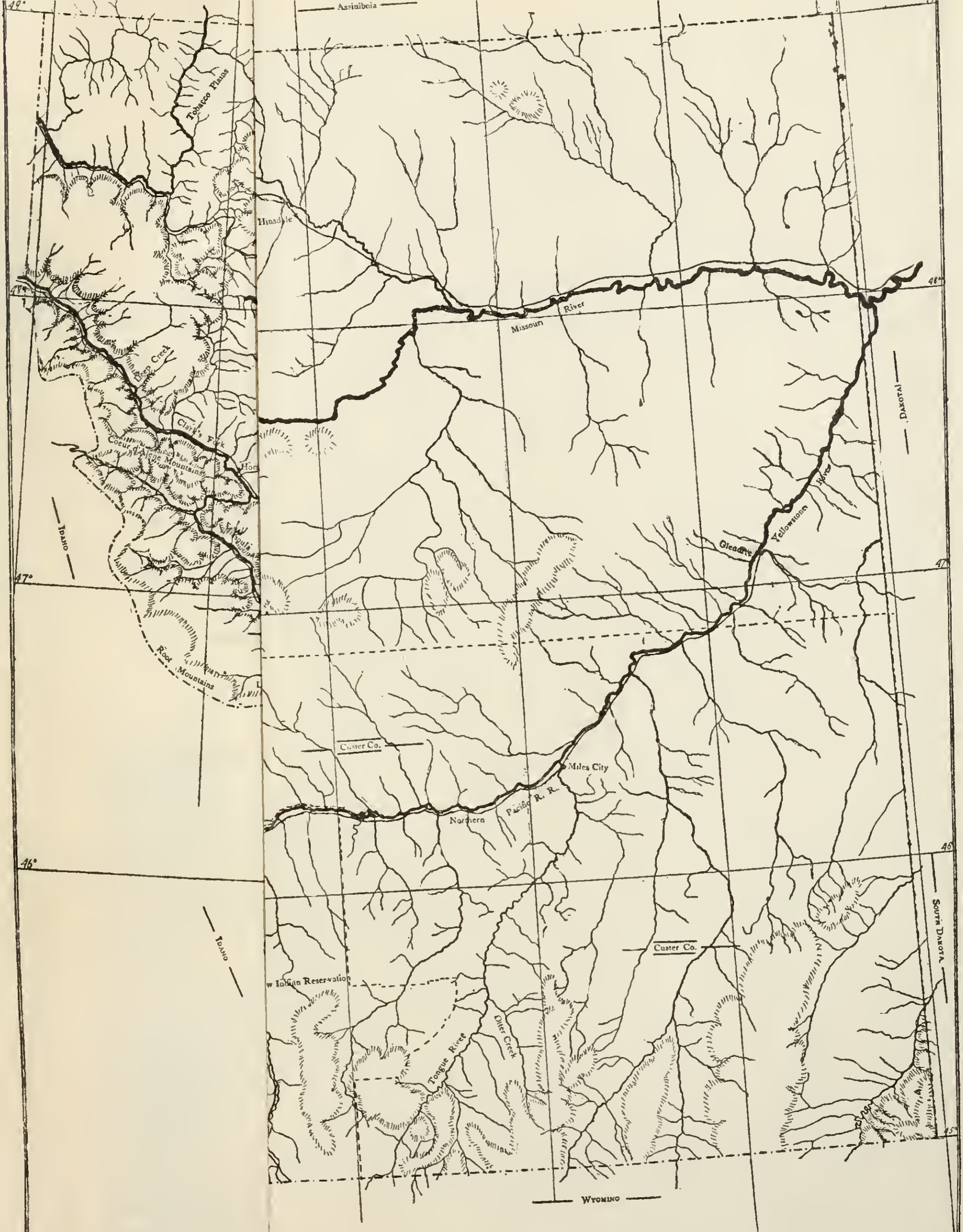
Tall, 1–2 m. high, glabrous, somewhat glaucous; leaves deeply pinnatifid, the lobes narrowly lanceolate or linear, acuminate, often lobed; panicle 2–4 dm. long; heads small, numerous, about 1 cm. high, campanulate; bracts purplish, glandular-dotted, in about 3 series, lanceolate, obtuse; flowers blue; achenes brown, ribbed, without a neck, wingless; pappus tawny.

Nearest related to *L. spicata*, but distinguished by the narrow leaf-lobes. In damp woods, up to an altitude of 1000 m.

Montana: Columbia Falls, 1895, *R. S. Williams* (type).

Oregon: Columbia River, *Scouler, 242.*

British Columbia: Sicamous, 1889, *John Macoun.*


Assiniboia
49°
Tobacco Plains
Hinsdale
48°
Missouri River
Deep Creek
Clark's Fork
Coeur d'Alene Mountains
Hors
Idaho
47°
Root Mountains
Dakota
Glendive
Yellowstone River
Custer Co.
Miles City
Northern Pacific R. R.
46°
Idaho
Custer Co.
South Dakota
Indian Reservation
Tongue River
Otter Creek
45°
Wyoming

ONTANA

and the

LLOWSTONE NATIONAL PARK.

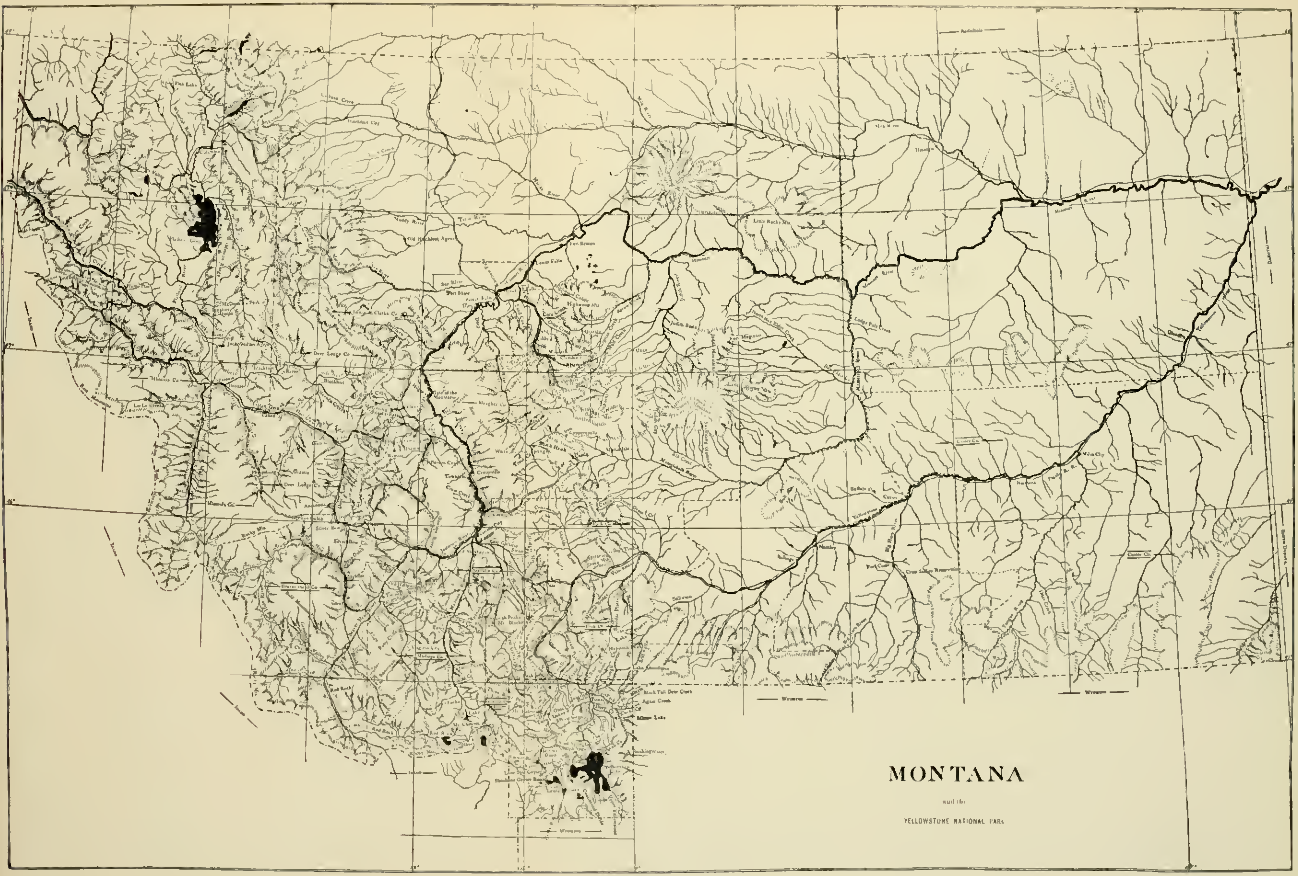

MONTANA
and the
YELLOWSTONE NATIONAL PARK
Assiniboia
Dakota
Wyoming
Idaho
Milk River
Little Rocky Mts
Missouri River
Lodge Pole Creek
Fort Benton
Lower Falls
Sun River
Fort Shaw
Old Blackfoot Agency
Teton River
Muddy River
Highwood Mts
Judith River
Judith Basin
Fort Maginnis
Gate of the Mountains
Meagher Co
Deer Lodge Co
Missoula Co
Musselshell River
Yellowstone
Big Horn River
Fort Custer
Crow Indian Reservation
Buffalo Co
Miles City
Powder R. R.
Glendive
Black Tail Deer Creek
Agate Creek
Mirror Lake
Shoshone Geyser Basin

TABLE OF DISTRIBUTION.

In the following table the letters at the heads of the columns have the following significance:

E. & W.	Plants found both east and west of the Rocky Mountain range; here are included also several introduced weeds of general distribution and most of the circumboreal and subarctic flora.
E.	Species found also east of the range, but not west; this includes also a few weeds.
W.	Species found also west of the range, but not east.
A.	Truly arctic plants found in the alpine regions at an altitude of about 3000 meters.
R.	Plants strictly endemic to the Rocky Mountain Region.
*	Species not described in Coulter's Manual of the Rocky Mountain Region.
New.	Species and varieties described for the first time in this volume.

	E. & W.	E.	W.	A.	R.	Tot	*	New.
Ophioglossaceae	3	—	—	1	1	5	2	—
Polypodiaceae	17	1	3	—	1	22	6	—
Marsileaceae	1	—	—	—	—	1	—	—
Equisetaceae	8	—	—	—	—	8	2	—
Selaginellaceae	—	—	—	—	1	1	1	1
Lycopodiaceae	1	3	—	—	—	4	3	—
Isoetaceae	—	—	1	—	—	1	—	—
PTERIDOPHYTA	30	4	4	1	3	42	14	1
Pinaceae	2	—	12	—	6	20	5	—
Taxaceae	1	—	—	—	—	1	1	—
GYMNOSPERMAE	3	—	12	—	6	21	6	—
Typhaceae	1	—	—	—	—	1	—	—
Sparganiaceae	2	—	—	1	1	4	3	—
Naiadaceae	13	3	1	—	1	18	8	1
Scheuchzeriaceae	2	—	—	—	—	2	—	—
Alismaceae	3	2	—	—	—	5	2	—
Gramineae	73	8	25	6	79	191	92	5
Cyperaceae	29	35	13	2	26	105	29	2
Araceae	—	—	1	—	—	1	1	—
Lemnaceae	3	1	—	—	—	4	2	—
Commelinaceae	—	1	—	—	—	1	1	—
Juncaceae	11	2	8	—	2	23	5	1
Melanthaceae	3	—	4	—	—	7	1	—
Liliaceae	4	3	14	—	7	28	11	1
Convallariaceae	1	—	4	—	1	6	3	—
Trilliaceae	1	—	1	—	—	2	2	—
Iridaceae	1	1	—	—	1	3	1	—
Orchidaceae	9	3	9	—	1	22	9	1
MONOCOTYLEDONES	156	59	80	9	119	423	170	11

TABLE OF DISTRIBUTION.—(*Continued.*)

	E. & W.	E.	W.	A.	R.	Tot.	*	New.
Salicaceae	7	3	7	—	12	29	8	—
Betulaceae	1	2	3	—	—	6	2	—
Urticaceae	1	2	1	—	1	5	1	—
Loranthaceae	—	—	1	—	1	2	1	—
Santalaceae	1	—	—	—	—	1	—	—
Polygonaceae	17	3	15	—	15	50	18	5
Chenopodiaceae	14	—	6	—	7	27	9	2
Amaranthaceae	3	—	—	—	—	3	—	—
Nyctaginiaceae	—	3	—	—	2	5	2	1
Portulacaceae	2.	1	7	—	3	13	5	—
Caryophyllaceae	4	2	6	—	2	14	5	—
Alsinaceae	10	3	14	1	6	34	15	1
Illecebraceae	—	—	—	—	1	1	—	—
Nymphaeaceae	1	—	1	—	—	2	—	—
Ceratophyllaceae	1	—	—	—	—	1	—	—
Ranunculaceae	8	14	25	2	22	71	29	6
Berberidaceae	—	—	1	—	—	1	—	—
Papaveraceae	1	—	—	—	—	1	—	—
Fumariaceae	2	1	—	—	—	3	1	—
Cruciferae	20	7	13	4	32	76	31	3
Capparidaceae	1	1	—	—	—	2	—	—
Droseraceae	1	—	—	—	—	1	—	—
Crassulaceae	—	—	2	1	2	5	—	—
Saxifragaceae	1	1	10	5	18	35	16	3
Parnassiaceae	2	—	1	—	—	3	—	—
Hydrangeaceae	—	—	1	—	—	1	—	—
Grossulariaceae	5	1	4	—	6	16	7	1
Rosaceae	15	6	20	6	37	84	32	3
Drupaceae	—	2	1	—	1	4	2	1
Pomaceae	2	5	2	—	3	12	7	—
Papilionaceae	17	21	22	2	60	122	52	13
Malvaceae	1	1	1	—	—	3	1	—
Hypericaceae	—	—	2	—	—	2	1	—
Elatinaceae	1	1	—	—	2	4	2	2
Violaceae	4	1	5	—	7	17	10	3
Geraniaceae	3	—	2	—	1	6	3	1
Linaceae	1	—	—	—	1	2	—	—
Polygalaceae	—	1	—	—	—	1	—	—
Euphorbiaceae	—	4	—	—	2	6	1	—
Callitrichaceae	1	1	—	—	—	2	—	—
Limnanthaceae	—	—	—	—	1	1	1	1
Anacardiaceae	1	2	—	—	—	3	1	1
Celastraceae	—	—	1	—	—	1	—	—
Rhamnaceae	1	—	3	—	—	4	—	—
Aceraceae	—	1	3	—	—	3	1	—
Loasaceae	2	1	—	—	3	6	2	2
Cactaceae	—	5	—	—	1	6	2	—
Elaeagnaceae	2	1	—	—	—	3	—	—
Onagraceae	4	5	18	5	11	43	23	3
Haloragidaceae	2	1	—	—	—	3	—	—
Araliaceae	—	1	1	—	—	2	—	—
Umbelliferae	6	7	13	—	15	41	16	2
Cornaceae	2	—	—	—	—	2	—	—
DICOTYLEDONES CHORIPET.	168	111	212	26	274	791	307	54

TABLE OF DISTRIBUTION.—(*Concluded.*)

	E. & W.	E.	W.	A.	R.	Tot.	*	New.
Pyrolaceae	7	1	2	—	—	10	3	—
Monotropaceae	2	—	1	—	—	3	—	—
Ericaceae	1	—	10	—	1	12	7	1
Vacciniaceae	3	—	2	—	2	7	3	1
Primulaceae	4	2	5	1	12	24	15	6
Gentianaceae	1	1	4	—	7	13	5	1
Apocynaceae	2	—	—	—	—	2	—	—
Asclepiadaceae	1	3	—	—	—	4	—	—
Convolvulaceae	—	2	—	—	—	2	1	—
Cuscutaceae	1	1	—	—	—	2	—	—
Polemoniaceae	6	—	16	—	17	39	18	5
Hydrophyllaceae	1	2	9	—	2	14	9	—
Boraginaceae	4	9	10	—	17	40	18	6
Verbenaceae	2	—	—	—	—	2	—	—
Labiatae	9	6	2	—	2	19	6	1
Solanaceae	3	2	1	—	—	6	—	—
Scrophulariaceae	12	7	39	1	34	93	43	15
Orobanchaceae	2	1	1	—	—	4	1	—
Lentibulariaceae	3	—	—	—	—	3	1	—
Plantaginaceae	4	—	1	—	2	7	3	1
Caprifoliaceae	8	1	3	—	2	14	3	2
Adoxaceae	—	1	—	—	—	1	—	—
Rubiaceae	5	—	2	—	2	9	3	1
Valerianaceae	1	—	4	—	—	5	2	—
Cucurbitaceae	—	1	—	—	—	1	—	—
Campanulaceae	2	1	—	—	—	3	—	—
Lobeliaceae	—	—	1	—	2	3	2	2
Compositae	32	46	81	3	136	298	115	44
Ambrosiaceae	4	1	1	—	—	6	—	—
Cichoriaceae	10	6	17	1	19	53	21	11
Dicotyledones Gamopet.	130	94	212	6	257	699	279	97
Pteridophyta	30	4	4	1	3	42	14	1
Gymnospermae	3	—	12	—	6	21	6	—
Monocotyledones	156	59	80	9	119	423	170	11
Dicotyledones Choripet.	168	111	212	26	274	791	307	54
" Gamopet.	130	94	212	6	257	699	279	97
Total	487	268	520	42	659	1976	776	163

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Synonyms are printed in *italics;* names of families and larger groups in CAPITALS.

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